

REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
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1. REPORT DATE (DD-MM-YYYY) 23/Oct/2001		2. REPORT TYPE DISSERTATION		3. DATES COVERED (From - To)	
4. TITLE AND SUBTITLE READINESS ESTIMATE AND DEPLOYABILITY INDEX REVISED FOR AIR FORCE NURSES (READI-R-AFN) AND READI-R-AFN SHORT FORM PSYCHOMETRIC EVALUATION				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
				5d. PROJECT NUMBER	
6. AUTHOR(S) LT COL COLLINS THERESA L				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) UNIVERSITY OF MARYLAND BALTIMORE				8. PERFORMING ORGANIZATION REPORT NUMBER CI01-288	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) THE DEPARTMENT OF THE AIR FORCE AFIT/CIA, BLDG 125 2950 P STREET WPAFB OH 45433				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Unlimited distribution In Accordance With AFI 35-205/AFIT Sup 1					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
20011115 139					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES 226	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER (Include area code)

Readiness Estimate and Deployability Index Revised for  
Air Force Nurses (READI-R-AFN) and READI-R-AFN Short Form [SF]:  
Psychometric Evaluation

by  
Theresa L. Dremsa Collins

Dissertation submitted to the Faculty of the Graduate School  
of the University of Maryland in partial fulfillment  
of the requirements for the degree of  
Doctor of Philosophy

2001

## ABSTRACT

Title of Dissertation: Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN) and READI-R-AFN Short Form [SF]:  
Psychometric Evaluation

Theresa Lynn Dremsa Collins, Doctor of Philosophy, 2001

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**Problem:** The Air Force (AF) mandates Medical Service maintain readiness for potential deployments. Reineck (1996; 1998) developed, tested and revised the Readiness Estimate and Deployability Index (READI) to assess Army nurses' preparedness for short-notice deployments. Six dimensions of Individual Medical Readiness (IMR) include: Clinical Competency; Operational Competency; Soldier Survival Skills; Personal/Psychosocial/Physical Readiness; Leadership and Administrative Support; and Group Integration and Identification. No instrument was available to assess preparedness of Air Force nurses.

**Purpose:** To evaluate the reliability and validity of the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN), and from analyses, derive and evaluate the READI-R-AFN Short Form [SF] in a large sample of Air Force nurses.

**Research questions:** What is the reliability of the READI-R-AFN and READI-R-AFN [SF] based on estimates of internal consistency, test-retest reliability, and multiple

correlation coefficient ( $R^2$ )? What is the validity of the READI-R-AFN and READI-R-AFN [SF] based on estimates of confirmatory factor analysis, and convergent-discriminant validity? In the pilot study a convenience sample of 181 active duty AF nurses (52%) responded to the READI-R-AFN; Derogatis Affects Balance Scale (DABS), a measure of emotional well being; and Brief Symptom Inventory-18 (BSI-18), a measure for psychological distress.

**Methods:** Convergent validation evaluated interrelation of items reflecting dimensions of IMR, affects balance, and psychological distress. The READI-R-AFN was refined via preliminary item analysis, internal consistency (alpha coefficient  $> 0.70$ ), test-retest reliability and structural equation modeling (SEM). Confirmatory factor analysis confirmed the hypothesized nature of the test structure using Flannery's (1994) model of Stress Resistant Persons. Significant items of the 83-item READI-R-AFN were retained for the shorter 40-item form of the READI-R-AFN [SF], subsequently tested for reliability and validity in another convenience sample of 500 active duty AF nurses with 205 nurses responding, (41% response rate).

**Results:** Six dimensions of IMR were confirmed in both samples of active duty AF nurses. Two correlated higher order factors, Skills, resembling Flannery's 'Mastery' domain, and Relationship, resembling Flannery's 'Attachment' domain, accounted for 56% of the variance of the IMR construct. Additional testing of the READI-R-AFN [SF] will further establish construct validity of the measure.



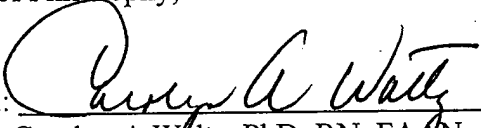


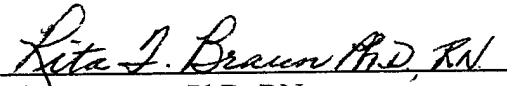
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Saudia (Collins), T.L., Kinney, M.R., Brown, K.C., & Young-Ward, L. (1991). Health locus of control and helpfulness of prayer in preoperative cardiac surgery patients. Heart & Lung 20, 60-65.

Saudia (Collins), T.L. (1989). The relationship between health locus of control and helpfulness of prayer in preoperative cardiac surgery patients. Unpublished master's thesis, University of Alabama-Birmingham, Alabama. Presented at Alabama State Nurse's Association Research Symposium-1989.

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Collins, T.L., Otto, D.W.,  
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Collins, T.L., Engel, C. E. Jr.,      Do mental disorders matter? A study of  
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### *Referenced*

Saudia(Collins), T.L., Kinney, M.R., Brown, K.C., & Young-Ward, L. (1998). Health locus of control and helpfulness of prayer in preoperative cardiac surgery patients. Referenced in The Faith Factor: Proof of the Healing Power of Prayer. By Dale A. Mathews, New York, NY: Viking Press, pp. 142-143.

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<u>Date of Award</u>	<u>Role</u>	<u>Title</u>	<u>Funding Agency/#</u>	<u>Amt. of Award</u>
2000	Principal Investigator	Readiness Estimate and Deployability Index Revised for Air Force Nurses READI-R-AFN: Psychometric Evaluation	TSNRP	\$ 20, 000
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## Dedication

First and foremost, I dedicate this work to My God. I would not be penning this dedication if I were not carried through many difficult moments on the wings of God's angels. I dedicate this work to two of God's special angels in my life, my daughters Maya and Alma Saudia. I thank them for the sacrifices they have made throughout their lives as I progressed toward the goal I now receive in this doctorate. I also dedicate this work to my grandson, Malachi Saudia who brought a spark of joy to my life during the many trying moments of doctoral studies when he entered the world at the end of my first year. In addition, I dedicate this work to my mother, Margaret Pettera, who gave me the drive to persist in achieving my goals. I include all of my brothers and sisters, *Michael, John, and* who would listen to me during difficult times and offer words of encouragement. Finally I dedicate this work to my dad, Fred M. Dremsa, who now rests in God's arms and intervenes in my life from a distance.

#### ACKNOWLEDGEMENT OF SPONSORSHIP AND DISCLAIMER

This research (TSNRP #N00-003, MDA #905-00-1-0006) was sponsored by the TriService Nursing Research Program and supported by a grant of \$20,000. The information or content and conclusions are those of the author and should not be construed as the official position or policy of, nor should any official endorsement be inferred by, the Uniformed Services University of the Health Sciences, the United States Air Force, the Department of Defense, or the United States Government.



## Acknowledgments

A very special expression of thanks for the opportunity to complete my doctoral studies and financial support which were provided by the United States Air Force and the TriService Nursing Research Program. Much thanks to Colonel Carol Reineck who had the vision to design a questionnaire that would provide a self-assessment of nurses' preparation for deployment. Because of her groundwork and shared ideas, I was able to carry this study forward. I also thank Major Joe Lamana who spent many hours on the telephone and provided several resources to help make this study a reality.

I welcome this opportunity to acknowledge and thank the many people who truly served as God's Angels in the assistance they provided as I progressed through my doctoral program and in completion of this dissertation. My deepest gratitude to Dr Rita Braun, my advisor and most loyal advocate through this entire process. From my initial encounter on the first day of theory class to the final word listed in this manuscript she never stopped believing in me and in my ability to bring this product to fruition. I am indebted to her for life for all she has done for me, including helping me to be consistent!!

My sincerest gratitude to every member on my committee who played a special part in the production of this work. To Dr. Leonard R. Derogatis, who provided me the opportunity to learn the process of research when he implemented clinical trials and guided the writing of my grant proposal that funded this study. His expertise as a Psychometrician facilitated this whole process. To Dr. Barbara Resnick who walked me through the process of structural equation modeling and gave constant words of encouragement and support during the many frustrating moments of learning the technique. I appreciate the hours taken out of an overwhelming schedule to give me much needed guidance. To Dr. Margaret McEntee, who enlightened me to the conceptual framework that pulled everything together. I am tremendously grateful for the entire day she gave from her busy schedule to help me diagram the framework for this study. To Dr D. Martha Turner, COL, USAF, NC who told me I could do this and kept me up to date

on the latest with all that is happening in the Air Force while I buried my head in my books! Many thanks for the ongoing consultation provided.

Special thanks to my closest friend and confidante, Keryl Bauer who shared in the roller coaster of life with me as I trudged through all of my doctoral courses, stressful exams and dissertation defense in the midst of a life in chaos. She was always there to console me during moments of grief and to share words of wisdom that would help me regroup and go on! My thanks to many friends and colleagues who studied with me and provided ongoing support and encouraging words as I progressed toward my goal: Amanda Greene, Jackie Moss, Beth Hill-Westmoreland, Staley Collins, Janice Hoffman, Zeina Khoury, Maher El Masri, Joan Warren, Caterina Lasome, Caryn Andrews, Eun Shim Nahm, Bev Meadows, Maggie Richard, Lorrie Powell, and Debbie Dang. Thank you all for your friendship.

A special note of gratitude to all the members in the Office of Research, Jacque' Gordon, Dawn Jackson, Joel Culpepper and Dr. Deanne Otto (even though she moved to Minnesota), who not only provided resource help but made me laugh and lifted my spirits in tough times as well as fun times! Thank you all for willingness to help whenever I needed it!! Special thanks to my good friend Marlene Vennell who shared in the most difficult struggle of my life, and who helped me keep going when I felt like giving up. I also thank my dear friends Mary Ellen Young, Sandy Pagel, Faith Cooley, Cindy Darling and Rosie Day who were always willing to listen and helped me believe in me! Special thanks to both of my daughters and my grandson for believing in me and giving up their time with me to allow me to reach my goal! I also thank Bryan Hall for the hours of data entry he completed so I could complete this work! And as always, special thanks to my God, His is the Glory!!

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## CHAPTER I THE PROBLEM

### Introduction

Medical Readiness is one of the primary concerns of the Department of Defense (DoD) (AF/XPXQ, 1999). The heightened importance of medical readiness was brought to the forefront by the modern political and military environments, which forecast an increased frequency of humanitarian missions and contingency operations over the next decade (Samuels, 1997). Along with other military branches and personnel, such operations have caused an increase in short-notice worldwide deployments (readiness missions) for Air Force nurses (Stierle, 1997). As a result, nurses are confronted with stress due to a number of factors, including separation from family and significant others, and the threat of personal danger. There is added stress due to the need to perform with proficiency the technical skills required for carrying out nursing care in an unfamiliar field environment with multiple types of casualties. Air Force nurses must be prepared for the expectations and rigors of military deployments. Sufficient preparation is needed so Air Force nurses will be able to focus on the goals of the mission, interact skillfully with complex environmental demands and maintain their physical and mental health. Currently, as outlined by Air Force Instruction 41-106, formal programs exist to prepare nurses in (a) clinical, field, and military competencies, (b) socialization for group

cohesion and (c) completion of the requirements on the deployment checklists (Air Force Instruction, 1999). In addition to formal programs, an instrument for self-assessment of an individual's preparedness to meet the expectations and rigors of military deployments has been developed for Army nurses (Reineck, 1998). Reineck (1996) employed focus groups of Army nurses who had extensive experience with deployment missions to assess their needs and sense of preparedness. Applying qualitative methods, focus group members' responses were analyzed and the dimensions of the concept of Individual Medical Readiness (IMR) were identified. Individual Medical Readiness (IMR) was operationalized by development of the Readiness Estimate and Deployability Index (READI) (Reineck, 1998). The READI was designed as a self-report rating scale and subsequently tested in a single sample of 225 Army nurses. The initial reliability and validity testing of the READI showed the measure was limited in its psychometric properties, therefore, further evaluation was required.

In addition to functional and skills measures, commanders need a reliable and valid measure of members' self-perceived state of preparedness to accomplish the mission. Knowledge of the nurses' perceptions is important because, in addition to mastery of skills, self-perceptions influence members' state of stress resistance (Flannery, 1994). The READI (Reineck, 1998) was intended to provide commanders in the Armed Forces with a reliable and valid measure of self-assessment to identify the degree to which nurse corps officers perceive they are prepared to meet the expectations and rigors of more frequent readiness missions (AF/XPXQ, 1999; Air Force Instruction, 1999; Department of Defense, 1998; HQA AFMSA/CCX, 1998). Theories of response to stress (Selye, 1956), and stress appraisal (Lazarus & Folkman, 1984), contributed to

Flannery's (1994) model of stress resistance, which provided the framework for this study. To evaluate the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN), two well-validated measures were used for convergent validation. The Derogatis Affects Balance Scale (DABS) an indicator of emotional well being (Derogatis, 1975, 1996a) and the Brief Symptoms Inventory-18 (BSI-18), an indicator of psychological integration (Derogatis, 1993, 2000), were selected to test the correlation with dimensions of the underlying stress resistance framework.

### Purpose of the Study

The purpose of this study was to evaluate the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN) in a sample of Air Force nurses, and to make modifications to the measure based on results of the pilot study. The psychometric properties of the modified Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form (READI-R-AFN [SF]) were then evaluated in a large sample of active duty Air Force nurses.

### Specific Aims

The specific aims of this study were to:

1. Revise specific subsections of the READI (Reineck, 1998) to develop the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN) and test its reliability and validity in a sample of active duty Air Force nurses.
2. Devise a brief form READI-R-AFN -Short Form [SF] of the READI-R-AFN for rapid administration based on pilot study results.
3. Validate and establish reliability for the READI-R-AFN [SF] in a sample of active duty Air Force nurses.

### Research Questions

This study addressed the following research questions:

1. What is the estimated reliability of the READI-R-AFN and the READI-R-AFN short form [SF] expressed in terms of (a) internal consistency, (b) test-retest reliability, and (c) multiple correlation coefficient ( $R^2$ )?
2. What is the estimated validity of the READI-R-AFN and the READI-R-AFN [SF] expressed in terms of (a) confirmatory factor analysis, and (b) convergent- discriminant validity in relation to the Derogatis Affects Balance Scale (DABS) (Derogatis 1975, 1996a) and the Brief Symptom Inventory-18 (BSI-18) (Derogatis, 1993, 2000).

### Research Hypothesis

Individuals with balance between positive and negative affects on the DABS (Derogatis, 1975; 1996a) and absence of dysphoric emotional conflict and psychological distress on the BSI-18 (Derogatis, 1993, 2000), will demonstrate higher readiness scores on the READI-R-AFN and the READI-R-AFN [SF].

### Conceptual Framework

Flannery's (1994) theory of stress resistance described the three components or domains of "Stress Resistant Persons as 'Mastery', 'Attachment', and 'Finding Meaning'". The domain of 'Mastery' can be perceived as related to the components of (a) clinical competence, (b) operational competence, and (c) soldier survival skills designed by Reineck (1998). The domain of 'Attachment' is reflected in the items, which measure (d) personal/ psychosocial/physical readiness, (e) group integration and identification, and (f) leadership and administrative support. The domain 'Finding Meaning' can also be perceived in items measuring leadership and administrative support (believing in the

mission and supporting one's country). Applying Flannery's (1994) concepts, the stress resistant Air Force nurse would be more likely to take action to fulfill the course requirements and specifications detailed by the Air Force to prepare himself/herself for deployment (Air Force Instruction, 1999). The ultimate outcomes are identified as the individual's perceived state of readiness for deployment, or an overall perception by the individual that he/she is not ready to deploy.

Instruments used to evaluate the perceived state of readiness were the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN), or the READI-R-AFN [SF], the Derogatis Affects Balance Scale (DABS) (Derogatis, 1975; 1996a), and the Brief Symptom Inventory-18 (BSI-18) (Derogatis, 1993; 2000). It was hypothesized that individuals with positive affects balance on the DABS (Derogatis, 1975; 1996a) and absence of psychological distress on the BSI-18 (Derogatis, 1993; 2000), that is those with psychological integration, would also report higher scores on the READI-R-AFN and the READI- R-AFN [SF].

### Methodology

This study was designed to test the reliability and validity of the READI-R-AFN when used with Air Force nurses. Reliability measures included estimates of internal consistency, test-retest, and use of structural equation modeling, which results in a squared multiple correlation coefficient ( $R^2$ ). Internal consistency reliability testing was employed to evaluate the consistency of performance of one group of individuals across all items on a single measure. Cronbach's alpha was used to express the extent to which items in a subscale are consistent in eliciting similar responses (Stevens, 1996). An alpha coefficient of 0.70 or higher was considered acceptable (Nunnally & Bernstein, 1994).



Test-retest reliability (Pearson's product moment correlation) was estimated as an indicator of stability of responses over one week. An estimate of reliability was calculated with structural equation modeling that was based on the squared multiple correlation coefficient ( $R^2$ ) of each item.  $R^2$  was used to estimate the systematic variance in the observed score that is explained by the model (Bollen, 1989).

Confirmatory Factor Analysis (CFA), a technique to estimate measurement models, was performed to assess the underlying domain structure of the READI-R-AFN and the READI-R-AFN [SF], and to evaluate factorial validity, i.e., the degree to which each item is related to the hypothesized domain with which it is linked (Stevens, 1996). CFA tests whether items designed to measure the same dimension load on the same factor. This analysis was used to indicate whether items in the instrument were a reflection of a single construct or several constructs. CFA is a form of factor analysis in which a preconceived model is specified in advance, prior to analysis of data (Bollen, 1989). According to Bollen (1989):

The number of latent variables is set by the analyst, whether a latent variable influences an observed variable is specified, some direct effects of latent on observed variables are fixed to zero or some other constant (e.g. one), measurement errors may correlate, the covariance of latent variables can be estimated or set to any value, and parameter identification is required ( p. 228).

When conducting analysis using CFA, the model may be modified using an exploratory means to improve the fit. Structural Equation Modeling (SEM) is one technique that can be used for the process of instrument modification (Tabachnick &

Fidell, 1996), and hence with the READI-R-AFN or the READI-R-AFN [SF] to improve the fit of the model. SEM provides an alternative method with which to estimate the validity of a measure by calculating an estimate of the correlation between the latent variable (Individual Medical Readiness) and its measure (READI-R-AFN).

Validity, according to Nunnally and Bernstein (1994) is one of the most important aspects of scientific generalization of an instrument. The validation process is identified as an ongoing collection of empirical evidence, resulting in a degree of assurance that a measure truly represents what it is designed to measure. Three major forms of validity contribute to this process of scientific generalization. First, construct validity, an overarching form of validity addresses the degree to which the operational definition adequately reflects the construct. Second, predictive or criterion-oriented validity reflects the statistical relationship to a specified criterion. Third, content validity assures that sample items selected for the identified measure represent the domain sufficiently. "Construct and predictive validity usually stress correlations among various measures, but content validity is largely based upon opinions of various users" (Nunnally & Bernstein, 1994, p. 84). Waltz, Strickland and Lenz (1991) recommend consulting a minimum of two experts to verify that objectives used to develop an instrument match the items selected to represent the specified domain, and to judge whether the items adequately represent the domain of interest according to the circumspection of experts. An index of content validity (CVI) is used to "quantify the extent of agreement between the experts" (Waltz, Strickland & Lenz, 1991, p. 173). Three experts with experience in deployments were consulted to confirm content validity of the READI-R-AFN.

Convergent-discriminant validity is a correlational form of construct validity to

“...demonstrate that the operational definitions of the test construct (s) in question correlate positively with like measures of the construct, and negatively with measures of dissimilar constructs” (Derogatis, 1996a, p. 17). Well-established measures are used to demonstrate the convergent-discriminant validity of a new measure. As part of convergent validation of the instrument, readiness scores were evaluated as a function of indicators of emotional well being and psychological integration using the DABS (Derogatis, 1975; 1996a), and the BSI- 18 (Derogatis, 1993; 2000).

#### Definitions of Relevant Terms

Relevant terms for the purpose of this study are defined as follows:

Military: All branches of the United States Armed Forces.

United States Air Force Nurses: Nurses serving on active duty in the United States Air Force Nurse Corps (AFNC).

Deployment: Involves the notification, departure, travel, and arrival to some destination where temporary living quarters and work environments are established for the purpose of supporting a defined military mission for a specified time and duration (Department of Defense, 1996).

Humanitarian Assistance (HA): (DOD) Programs conducted to relieve or reduce the results of natural or manmade disasters or other endemic conditions such as human pain, disease, hunger, or privation that might present a serious threat to life or that can result in great damage to or loss of property. Humanitarian assistance provided by US forces is limited in scope and duration. The assistance provided is designed to supplement or complement the efforts of the host nation's civil authorities or agencies that may have the

primary responsibility for providing humanitarian assistance. ( Department of Defense, 1995)

Military Operations Other Than War (MOOTW): Operations that encompass the use of military capabilities across the range of military actions that do not include combat.

These military actions can be applied to complement any combination of other instruments of national power and occur before, during, and after war but do not include armed hostile action (Department of Defense, 1995).

Perceptions of Readiness: In this study, scores of active duty Air Force nurses on the; (a) Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN) and (b)READI-R-AFN Short Form [SF].

Readiness: The sum total of nursing activities performed in the field environment. These include the ability to deploy, that is to move rapidly and effectively to a zone of operation, and employ, that is to engage actions to relocate without unacceptable delays (Zadinsky, 1996).

War: A state of undeclared or declared armed hostile action characterized by the sustained use of armed force between nations, or organized groups within a nation, involving regular and irregular forces in a series of connected military operations or campaigns to achieve vital national objectives (Department of Defense, 1995).

Worldwide Qualified for Deployment: An individual who meets a standardized set of jointly determined minimum criteria for medical and dental fitness (Department of Defense, 1995, DoD5136.1-P).

### Limitations

The process of data collection for this study involved carefully designed survey implementation. Information that some respondents may perceive as sensitive is required on questionnaires used in this study. The percent of response on this type of information and means of sampling is generally lower than that obtained through other data collection procedures (Dillman, 2000). Therefore, the need to rely on responses to a self-administered, self-report questionnaire presented a limitation in this study. Another limitation was, that although every effort was made to present questions and instructions clearly, it is possible that questions were still misinterpreted. As a result, measurement error, coverage error and sampling error are potential limitations (Dillman, 2000). Non-response was also a potential limitation of this study. Non-response error occurs when those who respond to a survey are different from individuals in the sample who did not respond, placing the data at risk for a systematic bias (Dillman, 2000).

Respondent burden was an additional limitation of this study due to the need to use additional measures for psychometric evaluation of a new instrument (Salant & Dillman, 1994). The new instrument was designed to assess six dimensions of nurses' self-assessment of individual perceptions of his/her preparedness for deployment, so a large number of items were initially included to represent each domain. Part of the process of refining a measure is to identify items that are not empirically representative of the domain through confirmatory factor analysis (CFA). Consequently, prior to the initial evaluation of items within each dimension, the questionnaire was lengthy. The use of two measures for convergent validation of the READI-R-AFN further added to the respondent burden of this study. Clarification of the need to refine the instrument for

future studies was emphasized in the introduction letter to help respondents understand the need for the lengthy questionnaire. In addition, although participants were selected from four large Air Force treatment facilities to obtain a representative sample of active duty Air Force nurses, it is still a convenience sample. Therefore, the use of a convenience sample precludes generalization of results beyond this study population (Keppel, 1991).

### Assumptions

Since this study was designed to evaluate psychometric properties of a modified instrument intended to measure nurses' self-perceived state of preparedness for deployment, it was based on the underlying measurement assumption which presupposes that the operational variable is a distinct representation of the conceptual variable (Mishel, 1989). In this case, conceptually, the construct of Individual Medical Readiness consists of a set of variables operationalized by a number of items representing each of the dimensions of readiness on the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN) and the READI-R AFN Short Form [SF]. Since these instruments are self-report rating scales, it is assumed that the individual will understand the items and respond truthfully.

### Summary

The current climate of decreasing personnel within the military, coupled with an increase in military requirements to respond to contingency operations worldwide, challenges those responsible to prepare personnel for deployment and to assess their perceived state of preparedness. A standard test development strategy was used to evaluate the psychometric properties of the READI-R-AFN and READI-R-AFN [SF],

instruments to measure members' perceived state of preparedness for military deployments. This process assessed applicability of the READI-R-AFN to Air Force nurses and will provide commanders in the Air Force with a substantiated instrument to identify the extent to which nurses believe they are prepared for the expectations and rigors of short-notice readiness missions.

Flannery's (1994) Model of Stress Resistant Persons which identifies mastery, attachment and meaning as domains of stress resistance, was used as the conceptual framework to guide the relationship of measures selected for the evaluation of an individual's self-perceived state of readiness for military deployments. With sufficient validation, the self-assessment of Air Force nurses of their readiness for deployments will be a useful diagnostic tool to pinpoint specific areas where further deployment preparation is needed.

The Medical Readiness Strategic Plan (MRSP) pointed out that "... the ability to field mission-capable medical units and individuals ready for rapid mobilization and strategic deployment and to sustain medical support for any mission rests on timely and accurate information about those units and individuals, their capabilities, and their performance" (Department of Defense, 1998, p. 38). Development of a revised, short version of the READI-R-AFN, the READI-R-AFN [SF] would hopefully enhance the likelihood of completed responses; provide timely and accurate information about individuals' perceived state of readiness; and help to identify areas where specific training is needed to enable them to achieve a sense of confidence in their medical and military readiness.

## CHAPTER II REVIEW OF THE LITERATURE

### Introduction

The purpose of this study was to test the psychometric properties of the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN), and based on information from pilot study results, to develop and test the Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form (READI-R-AFN [SF]). Literature on the effects of stress on physical, psychological and social well being and performance has developed since Selye's (1956) findings. Particularly of interest is the work on stress appraisal and coping conducted by Lazarus and Folkman (1984) who identified that situations are described as positive, irrelevant or stressful. Individual judgment that a person-environment relationship is stressful is dependent on initial cognitive appraisal of the situation, and these effects and the modification of these effects is influenced by the individual's use of alternate cognitive appraisals. Exploratory studies and anecdotal nurse histories of a variety of deployment experiences have depicted the stressful nature of military deployments, including recognition that appraisal of stressful events as a challenge enabled the nurses to gain a sense of confidence and accomplishment (Barger, 1991). The immediacy of departure, uncertainty of events, and potential threats to health and life are sources of stress associated with military



deployments. The notion to enhance stress resistance would be an important aspect in the preparation of nurses for deployment. It is important to understand if the current program of preparation enables nurses to perceive themselves as more prepared for deployment.

Flannery (1994) has proposed a Model of Stress Resistance that can be applied to the dimensions of a self-assessment instrument that measures perceptions of readiness to deal with the demands and stress of frequent deployment missions. Flannery (1994) noted that "... reasonable mastery of daily events, caring attachment to others and a meaningful purpose in life are the three basic domains that lead to good physical and mental health and a sense of well-being" (p. 9).

#### Military Deployments

According to the Air Force Medical Readiness Strategic Plan (MRSP), 1998-2004 (Department of Defense, 1998), the primary medical readiness mission is to support combat forces in war and peacetime. This support must take place rapidly and effectively across the entire spectrum of potential military operations (Department of Defense, 1998). Preparing to accomplish this mission involves training personnel to provide top quality health services in a globally uncertain environment, where service members may deploy to any international location on very short notice. Changes in foreign and domestic policy, "...coupled with budget and personnel reductions in the Armed Forces, challenge the Department of Defense's (DoD) ability to successfully accomplish the primary medical mission to provide top quality health services whenever needed in support of military operations" (Department of Defense/MRSP, 1998, p. 22).

### Stress of Military Deployments

Frequent deployments have become the reality for Air Force nurses currently on active duty, and may affect reservists as well. The nature of deployment missions are stressful as a result of the potential for personal danger, separation from family and friends, and the high technical skill required to deal with the practice of nursing in the field environment. Since Florence Nightingale first organized a team of nurses during the Crimean War, numerous anecdotal accounts have acknowledged the stress of nurses' experience during the provision of nursing care while deployed in support of war (Barger, 1991; Dahl & O'Neal, 1993; Dolan, 1963; Fessler, 1996; Goldie, 1997; Higgins, 1996; Holm, 1982; Kalisch & Kalisch, 1976; Kalisch & Kalisch, 1995; Kassner, 1993; Marshall, 1987; Norman, 1986; Norman, 1990; Norman, 1999; Odom, 1986; Palmer, 1991; Paul, 1985; Pokorny, 1992; Scannell-Desch, 1996; Schwartz, 1987; Tomblin, 1996; Walker, 1997). These reports are one source of first hand information of nurses' response to stress in the field environment.

### Significance of Nurses' Deployment Experience

Nurses' lived experiences during deployments, as described in previous studies, have provided a rich knowledge base of nurses' perception of their experience. Common themes, which include life in a field environment and provision of nursing care to the human body mangled and destroyed by weapons, emanate from the responses of military nurses. Norman (1986) obtained oral histories from 50 nurses who deployed to Vietnam. Army, Navy, and Air Force Nurse Corps officers were interviewed to gain information about their war experiences. "Regardless of their experience or branch of service, the majority of nurses interviewed (80%) felt there was little that could be done to prepare them for the war" (Norman, 1986, p. 49). The nurses indicated personal experiences could not be separated from their professional experiences of the war. "The nurses worked, ate, slept, and relaxed in the same environment, the same place. They were confined to their ships, planes, and military bases. The people they saw during work

were the same people they spent their off-time with" (Norman, 1986, p. 52). Whether working in an intensive care unit faced with the intense trauma of war-ravaged casualties or providing care on medical units, death was an ever-present reality for nurses deployed during the Vietnam War. Nurses deployed to the Persian Gulf during Operation DESERT STORM (Concannon, 1992; Dahl & O'Neal, 1993) reiterated the stressful nature of deployments in support of war.

Dahl and O'Neal (1993) surveyed 43 nurses in an Army unit deployed to Operation DESERT STORM in 1991. Thirty-six nurses responded (response rate of 84%) and indicated the stressors which had a negative effect on working conditions were: severe environmental conditions, lack of creature comforts, lack of recognition and appreciation, misinformation, complaining, and lack of leadership and organization of command. Findings revealed the majority of nurses believed lack of leadership responses was the greatest stressor (Dahl & O'Neal, 1993). Other stressors impacting the experience of this deployment included: loss of income, loss of property, relocation of families, loss of privacy, uncertainty, exhaustive physical training, fatigue, radical change of diet, loss of sleep, total change of daily activity, threats of chemical warfare, effects of nerve agents, lack of information sharing and communication, severe weather, dirt and sand, lack of water, food and supplies, scud missile attacks, nearness to the battle zone, caring for severely wounded and occasional illness, loneliness, homesickness, and/or boredom. Similar themes of the stressful nature of deployment in support of war have been acquired from nurses deployed to World War II, Korea, and Vietnam (Stanton, Dittmar, Jezewski, & Dickerson, 1996).

Stanton, Dittmar, Jezewski, and Dickerson (1996) conducted a phenomenological study with 22 nurse veterans asking: "What effect has your wartime experience had on your personal and professional nursing career?" (p. 344). "Feelings and experiences during and after the war were characterized as fatigue because of unrelenting physical and mental demands, confusion, fear, sadness, grief, revelation, guilt, and repression"

(Stanton, et al., 1996, p. 344). In addition to physical exhaustion and mental demands, nurses also faced unique living and working conditions. "It was the environment in which nurses practiced that was so different .... crudely constructed hospitals that were undersupplied, very often understaffed .... personal dangers varied from chemical warfare and contracting tropical diseases to being wounded by enemy fire or by weapons found on wounded soldiers" (Stanton, et al., 1996, p. 345). The detrimental effects of grueling stressors these nurses and soldiers encountered have resulted in a psychopathological condition known as post-traumatic stress disorder (PTSD) (American Psychiatric Association, 1994). PTSD may be caused by exposure to "... a psychologically distressing event that is outside the usual range of human experience" (Everly & Lating, 1995, p. 6).

Stretch, Vail and Maloney (1985) surveyed 518 nurse veterans who served in Vietnam, receiving responses from 387 subjects (response rate 75%). Data from 361 subjects was complete and was included in their analysis. Results indicated "... 26 nurses (7.2%) suffered PTSD while in Vietnam but have no current symptoms, 7 nurses (1.9%) experienced PTSD while in Vietnam and are still experiencing symptoms, and 5 nurses (1.4%) did not experience PTSD while in Vietnam but are currently experiencing symptoms" (Stretch, et al., 1985, p. 707). Summarizing the responses, the authors found the current PTSD rate for Vietnam veteran nurses to be 3.3%, which was comparable to nonnurse active duty Veterans (5.1%). As a result of the potential for detrimental effects of the deployment experience, it was recognized that efforts must be made to prepare nurses in advance for the expectations and rigors of frequent military deployments. The Air Force needs nurses who are able to focus on the goals of the mission, can interact appropriately with the stressful environment, meet professional demands and maintain their physical and mental health. Use of Flannery's (1994) model of stress resistance is perceived as one way to assess and devise preparation that will enable nurses to meet the challenges set before them by stressful deployments.

### Theoretical Framework

The overall theory guiding Flannery's (1994) model is based in response-oriented theories of stress (Selye, 1956; Lazarus & Folkman, 1984). A response-oriented theory of stress relates the organism's response to environmental events to stress effects. Response-oriented theory "... reflects the central underlying tenet that well-being and stress are essentially incompatible states and that to the extent that stress is present, personal well-being is impaired" (Derogatis & Palmer, 1998, p. 90). The conceptual framework for this study combined response-oriented theory with Flannery's (1994) model of stress resistance, which can temper the effects of stress exposure or experiences. The Derogatis Affects Balance Scale (Derogatis, 1975; 1996a) and the Brief Symptom Inventory-18 (Derogatis, 1993; 2000), which were used for construct validation of the READI-R-AFN and the READI-R-AFN [SF], are also based in the response-oriented theory of stress (Derogatis & Lynn, 1999).

### Conceptual Framework

Flannery's (1994) model of stress resistance, displayed in Figure 1, was used to evaluate and refine the READI (Reineck, 1998), and to evaluate nurses' stress of deployment and their ability to establish some resistance to that stress. Measures used to evaluate the perception of readiness preparation are described.

Flannery (1994) conducted several studies with the ultimate goal of treatment for anxiety by identifying coping strategies used by individuals who continuously functioned with high energy levels, were rarely ill, and maintained well-being in spite of intense demands placed on them. As a clinical psychologist, he examined how some individuals could maintain this high-energy state while others would succumb to illness or exhaustion (Flannery, 1987; Flannery, 1990). He stated "I coined, the term Stress-Resistant Persons because the strategies for coping employed by these men and women resist or mitigate the potentially adverse impact of life stress on health and well-being" (Flannery, 1994, p. 24). He noted the presence of primarily six strategies that enable an

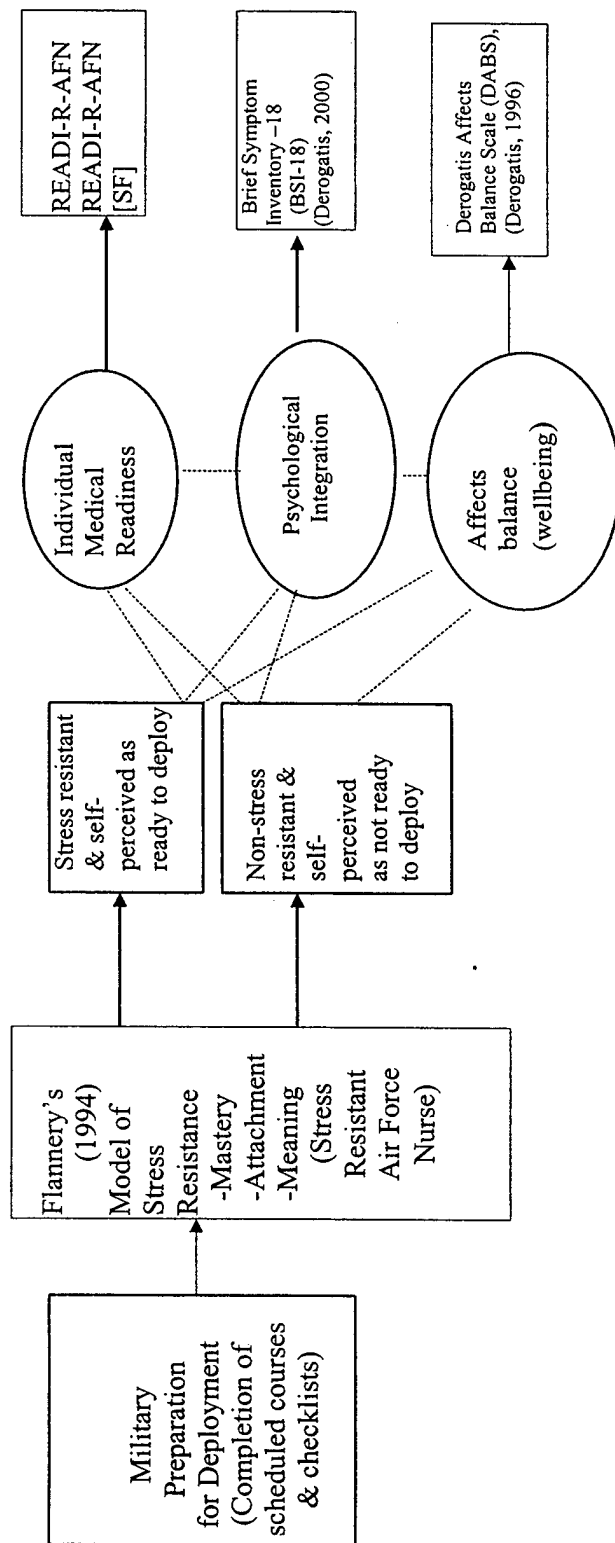


Figure 1: Conceptual Framework using Flannery's Model of Stress Resistance

individual to become stress-resistant. The six strategies are: (a) take personal control, (b) be task involved, (c) make wise lifestyle choices (few dietary stimulants [i.e. coffee, tea] aerobic exercise, relaxation techniques), (d) seek social support, (e) have a sense of humor, and (f) espouse religious and ethical value of concern for others (Flannery, 1994, pp. 25-30).

Personal control involves self-directed behavior to seek resources and take the actions one has control over when faced with a stressful situation; "... such skills are the basis for reasonable mastery" (Flannery, 1994, p. 26). Task involvement is a reflection of the person's reason to live or "purpose in life": "(a) Personal involvement in and commitment to a personally meaningful task leads to better individual health. (b) Boredom, which is another way of describing lack of task involvement, is a powerful negative life stress in its own right and is better avoided. Stress resistant persons are rarely bored; they make it a point to find meaning in life" (Flannery, 1994, p. 26). (c) Wise life-style choices refer to healthy behaviors that reduce stress and ward off unhealthy consequences. Unhealthy stimulants aggravate the body's stress response and produce a heightened sense of anxiety. Additional healthy choices such as regular exercise and relaxation techniques are well known measures to counteract the negative effects of stress. (d) Social support pertains to helpful interactions with other human beings and has been found to have many physical and psychological benefits for stress resistance (e) Humor is important to enable individuals "... to keep problems in perspective, and appears to reduce the physiology of stress" (Flannery, 1994, p. 28). Finally, (f) the category of religious and/or ethical values primarily refers to concerns for the welfare of others. Individuals who practice the 'Golden Rule' "... may not be active church, synagogue, or mosque attendees, but the decisions that guide their daily lives are influenced by ethical regard for others" (Flannery, 1994, p. 29).

The six strategies of the Stress Resistant Person were integrated in the three domains of (a) reasonable mastery of daily events, (b) caring attachment to others, and

(c) meaningful purpose in life. Taking the steps to incorporate the concepts described in Flannery's (1994) Model of Stress Resistance with a self-assessment of nurses' preparation for deployment would be one way to evaluate whether a nurse sees herself/himself as more stress resistant and better prepared for the demands of deployment.

#### Air Force Preparation for Deployments

Currently the Air Force has standardized procedures in place to prepare Air Force nurses for the frequently occurring deployments of today's demanding military mission. The military mission has a primary goal to support worldwide contingency operations called Military Operations Other Than War (MOOTW) (Department of Defense, 1995; Magyar, 1994; Hacker, 1994). "MOOTW encompasses a wide range of activities where the military instrument of national power is for purposes other than the large-scale combat operations usually associated with war" (Joint Pub 4-02, 1995, pp. IV-1). Preparing personnel for this worldwide tasking in addition to wartime contingencies is commonly understood as 'maintaining personnel readiness' (Department of Defense, 1998).

The Air Force has spelled out training requirements that prepare nurses for deployments in Air Force Instruction (AFI) 41-106 (Air Force Instruction, March 1, 1999). Presently, there are a variety of formal courses in effect to ensure competence in a vast array of technical readiness skills and maintain an ongoing level of overall preparedness. Formal courses include: Critical Care Air Transport Team (CCATT), Flight Nurse Course (FN), Aero medical Evacuation Contingency Operations Training (AECOT), Aero medical Staging; Joint Readiness Training (JRT), Medical Red Flag (MRF), Basic Medical Readiness Course (BMRC), Medical Readiness Indoctrination Course (MRIC), Combat Readiness Training (CRT), Combat Casualty Care Course (C4/C4A), Battlefield Nursing (BFN), Reserve Medical Red Flag Training (RMRFT), and the Public Health Contingency Operations Course (PHCOC).



The specifics of didactic training, as well as the responsibilities and requirements of individuals attending the courses are spelled out in this Air Force Instruction (Air Force Instruction, 1999). The courses are designed to prepare clinically competent nurses who can transition to the field environment with the skills necessary to provide care to individuals injured by the weapons of war and other contingencies. In addition, socialization of the nurse as a team member is a process component that occurs during formal military courses to foster unit cohesion, leadership and follower ship in personnel. Medical Red Flag (MRF), Basic Medical Readiness Course (BMRC), and the Medical Readiness Indoctrination Course (MRIC) are specifically designed to provide the basic skills necessary for nurses to care for casualties in a field environment. Aero medical Staging provides flight nurses with skills for air evacuation, and the Public Health Contingency Operations Course prepares nurses to set up and perform field operations. Successful completion of these courses by passing with scores > 70%, and meeting requirements of physical and dental health deem an individual as worldwide qualified for mobility (Department of Defense, 1998, DoD 5136.1-P).

#### Response to Deployment Preparation

Although required training may be thoroughly described, well structured, and regularly occurring, some individuals who have experienced deployment have voiced concerns that deployment preparation was inadequate. A study by McRae-Bergeron and colleagues (1999) used three separate instruments to compare the state of well being of 636 personnel who were taking part in medical readiness training compared to a group of 127 personnel who had recently returned from an overseas deployment. Results showed that individuals uncertain of mobility status and those with an absence of prior overseas deployment experience had negative health effects. Post-deployed personnel were also invited to write down their comments related to medical readiness. Some aspects of medical readiness training were highly criticized as inadequate and unrealistic. The authors recommended, "... realistic mobility training concentrating on essential job

performance elements, leadership providing clear and open channels of communication, and dealing effectively with the emotional impact of humanitarian assistance missions” (McRae-Bergeron, et al., 1999, p. 379). These recommendations by McRae-Bergeron, et al., (1999) are representative of the need for improved preparation in the domains of mastery, attachment, and meaning as addressed in Flannery’s (1994) Model of the Stress Resistant Persons.

The findings of a number of studies, some of which have been discussed above, that have been conducted on the nurses’ experience in deployment missions, also address elements of Flannery’s (1994) domains of mastery, attachment and meaning. A recurring theme in the reports of those who have deployed, which reflects Flannery’s conceptual model of the Stress Resistant Persons, is the emphasis on the importance of individual responsibility to access available resources and to take control of their deployment preparation so they will be more adequately prepared. For example, themes articulated by Flannery’s model can be identified in Concannon’s (1992) work with nurses deployed during Operation DESERT STORM.

Concannon (1992) used a grounded theory approach to describe in detail the experiences of three nurses after their deployment in support of Operation DESERT SHIELD/DESERT STORM. Based upon lengthy interviews, categories of responses that were identified in her work include: camaraderie, ethical issues, patriotism, technical preparations, leadership, personal growth, mortality, loss of identity, spiritual support, information seeking, support from home, military concerns, waiting, and feeling alone. The central themes of personal growth, camaraderie, and patriotism, emerged as key concepts for Concannon’s (1992) framework of the deployment experience. Concannon’s key concepts can be viewed as parallel to Flannery’s (1994) domains of ‘Mastery’, ‘Attachment’, and ‘Finding Meaning’.

Based on categories that emerged in her study, Concannon (1992) proposed a *Conceptual Orientation of Factors Affecting the Outcome of Deployment of Military*

*Nurses.* This framework specified personal, professional and military concerns of deployment that create “... stress of uncertainty” (Concannon, 1992, p. 15). Successful coping strategies must be employed for the military nurse to achieve a positive outcome, or adapt to the situation. Personal concerns identified were family security, relationships, safety and support of country. Training, triage responsibility and adequate equipment were the areas of professional concern. Military concerns included chain of command, base security and proximity of combat. Coping mechanisms identified were avoidance, information seeking, social support, selective inattention, credible authority, education, and illusions. Positive outcomes included productivity and interaction with others.

Although key concepts emerged which are related and contribute to a model of Stress Resistant Persons and could contribute to the development of a theory of deployment, efforts were not taken to operationalize these concepts. Concannon’s work was an early effort to study nurses’ responses to a deployment experience. Studies that address the nurses’ experiences of being deployed have been conducted since Concannon’s study, and describe multiple mitigating and buffering factors associated with the stresses of deployment.

Stanton, Dittmar, Jezewski and Dickerson (1996) conducted a phenomenological study through interviews with 22 nurse veterans. Five common themes emerged from the data as central to the experience of providing nursing care in wartime settings. These themes included: “... reacting personally to the war experience, living in the military, the meaning of nursing in the military, the social context of war, and images and sensations of war” (Stanton, et al., 1996, p. 344). The authors applied the findings to the importance of preparation of nurses for future military experiences, stating: “Future nurses must not only be prepared clinically but they should also be prepared emotionally and educated for the experiences associated with military service” (Stanton, et al., 1996, p. 347). Although anecdotal accounts are helpful, and these subjective reports can contribute to objective literature, they are limited in providing the guidance needed to establish a formal method

of deployment preparation for nurses. Recently, more structured methods have been implemented as a means to gain insight into what is needed to assist nurses with ways to cope with the stress they must face as a result of the reality of frequent deployments.

Stanton-Bandiero (1998) incorporated the themes identified in the above qualitative study to develop a survey as a means to gather data on military nurse veterans' experiences and duties related to the social context of war, reactions to war and sensations of war. Out of 500 mailed surveys, 340 had complete data for analysis. Eighty percent of the nurses surveyed indicated inadequate training prior to deployment, but believed they were still able to provide adequate care. Clinical skills were given the highest priority for prewar training, emotional and coping skills were ranked second, and soldier/military skills were ranked third. "Most of the nurses (80%) surveyed indicated it would be possible to clinically and physically prepare nurses for future duty during war or conflict. Only 10% of the nurse respondents believed you could prepare nurses psychologically for nursing in a wartime environment" (Stanton-Bandiero, 1998, p. 6). Importance of clinical skills was related to the profound trauma of wartime casualties. One hundred percent (100%) of the respondents identified that support from colleagues was most crucial to their general well being and survival during the war experience, as well as to their ability to adjust upon their return from the war environment. Adjusting to a war-ravaged environment during a deployed experience was also addressed by Scannell-Desch (1996) in her study of nurses who deployed during the Vietnam War.

Scannell-Desch (1996) conducted a phenomenological study with 24 nurses who had served during the Vietnam War. Nurses emphasized the importance of intense training that was realistic and would teach nurses how to care for trauma patients without the use of the latest medical technology and equipment. Nurses also pointed out that it was vital for them to understand the mission and the role of the military nurse in the deployed setting. The seven metathemes generated through the transcribed interviews were: facing moral and ethical dilemmas, giving of oneself, improvising, feeling out of

place, lacking privacy, recreating home, and bonding. Improvising would be an example of Flannery's (1994) concept of 'Mastery'. The metathemes of feeling out of place, lacking privacy and recreating home may reflect Flannery's concept of 'Attachment', as would bonding. Facing moral and ethical dilemmas, and giving of oneself are metathemes that most represent 'Finding Meaning' as defined by Flannery (1994). "Bonding was characterized as a unity of purpose in providing care, a sense of equality and kinship among military personnel and a sense of loyalty to each other, the medical mission, and their country" (Scannell-Desch, 1996, p. 8). Slusarcick, Ursano, Fullerton and Dinneen (1999) used a more quantitative scientific method to examine stressful responses of personnel deployed on a ship during Operation DESERT STORM.

Slusarcick, Ursano, Fullerton, and Dinneen (1999) surveyed healthcare personnel deployed on a hospital ship during the Operation DESERT STORM to examine stressors and stress reduction techniques with a questionnaire developed by the researchers. Items included stressors and stress reducers unique to a shipboard setting, and were analyzed for male and female participants separately on the following data that is inclusive for everyone. Thirty-five percent of the 250 respondents were nurses, but they were not analyzed separately as a group. Exploratory factor analysis was used to analyze the data, extracting three factors (loadings  $>0.40$ ) for male participants ( $N=128$ ). Factor 1, which included four items (fear of fire, fear of terrorists, fear of the ship sinking, fear of dying) accounted for 60% of the variance. Factor 2 contained three items (fear of others' death, combat casualties stress, fear of the unknown) and accounted for 25% of the variance. Factor 3, which accounted for 14% of the variance had only one item, heat stress. "Separation from family did not load above our 0.40 cutoff point on any one factor, although it did load highest on factor 2" (Slusarcick, et al., 1999, p. 168). When analyzed for female participants ( $N=110$ ), only two factors were extracted. Factor 1 was comprised of the same four items found in males and represented 79% of the variance. Factor 2 contained four items (separation from family, fear of death of others, combat

casualties stress, and fear of the unknown) and accounted for 20% of the variance.

Stress reduction techniques were also factor-analyzed and differed for males and females. For males, four factors emerged with analysis: Factor 1 (reading and writing mail) accounted for 56% of the variance; Factor 2 (reading and time using the library) accounted for 20% of the variance; Factor 3 (time on the weather decks, time alone, eating) accounted for 12% of the variance; and Factor 4 (going to movies, eating, being with a friend) accounted for 12% of the variance. Four factors also emerged for female respondents, but were notably different than those of the males. Factor 1 (reading and going to the library) accounted for 42% of the variance; Factor 2 (going to the gym and going to movies) accounted for 28% of the variance; Factor 3 (eating and time spent alone) accounted for 17% of the variance; and Factor 4 (reading and writing mail) accounted for 12% of the variance. In this analysis as well, the domains of the Stress Resistant Person (Flannery, 1994); (a) mastery through personal stress reduction activities, (b) attachment through social support and (c) finding meaning during time spent alone, were reflected in techniques used by healthcare personnel on a hospital ship. Dahl and O'Neal (1993) also addressed stress reduction techniques employed by nurses during their deployment experience to Operation DESERT STORM and found results similar to those shown by Slusarcick, et. al., (1999).

As noted previously, Dahl and O'Neal (1993) developed a questionnaire on use of coping behaviors to survey a reserve unit of nurses who deployed to Saudi Arabia during Operation DESERT STORM. Thirty-six out of 43 nurses responded (response rate of 84%). Again, coping behaviors employed were notably representative of the domains of 'Mastery', 'Attachment' and 'Finding Meaning' as characteristic of Stress Resistant Persons described by Flannery (1994). "Coping behaviors reported to have a positive effect on working conditions were exercise and recreation, developing psychological coping skills, support from friends and socialization, patient care and optimum level functioning, and spiritual activity" (Dahl & O'Neal, 1993, pp. 18-19). Forty-five percent

of the nurses in this study identified their experience as positive, with an opportunity for growth, and 58% indicated it improved their confidence and survival skills. In Flannery's (1994) terms, they became more stress resistant. Eighty-two percent believed the most effective coping behaviors were keeping a perspective, learning to accept what cannot be changed, exercise and recreational activities, humor, and discussing issues with supervisors. Complaining, getting angry, listening to rumors, and giving feedback to command were identified as least effective ways of coping and were viewed as behaviors that would work in opposition to stress resistance (Dahl & O'Neal, 1993).

In summary, the recommendations McRae-Bergeron, et al., (1999) for more realistic mobility training, along with previous studies that include nurses' experience in deployment missions, reflect the domains of 'Mastery', 'Attachment', and 'Finding Meaning' addressed in Flannery's (1994) model of Stress Resistant Persons. A recurring theme reflected by Flannery's conceptual model of the Stress Resistant Person emphasizes the importance of individual responsibility to access available resources. These are essential elements in individuals' ability to take control of their deployment preparation so they will be more adequately prepared.

#### A Model of Readiness

The above literature review addresses findings gained through nurses' deployed experiences, which can contribute to a theoretical framework for medical readiness, as well as to strategies for deployment preparation. In addition, strategic plans clearly spell out responsibilities associated with medical readiness, although they fail to specify what the term 'readiness' means conceptually. Kennedy, Hill, Adams and Jennings (1996) presented a theoretical definition of "readiness" as one component of a *Conceptual Model of Army Nursing Practice*. Readiness is described as, "the single variable that distinguishes military nursing from civilian nursing" (Kennedy, Hill, Adams & Jennings, 1996, p. 33). The model depicts "readiness" as the umbrella term that encompasses all activities of Army nurses. This model addresses a conceptual picture of "readiness", but

fails to operationalize the term in a manner that is measurable or to contextualize the components in a theoretical framework. Since there was not a theoretical foundation to specifically detail the concept of readiness or delineate how it would be measured, Reineck (1996) pursued concept clarification through focus group techniques.

#### Readiness Estimate and Deployability Index (READI)

Reineck (1996) employed three focus groups with ten members in each group to inductively conceptualize individual medical readiness. Focus group members were active duty and reserve Army nurses who were representative of a wide array of grade in service, military deployment experience, nursing specialties and geographic assignment. Members clarified their ideas regarding medical readiness, and made recommendations specifying how all concepts related to medical readiness fit together, which not surprisingly mirror the domains of mastery, attachment and meaning addressed in Flannery's (1994) model of Stress Resistant Persons. The first phase of the research program developed the theoretical definition of individual medical readiness, detailed variables derived from the theoretical definition, and identified observable indicators.

As a result of ideas generated through focus group techniques, a definition Individual Medical Readiness (IMR) was derived as, "... a dynamic concept with dimensions at the individual, group, and system levels which, together, influence one's ability to prepare to accomplish the mission" (Reineck, 1996, p. 23). In addition, recurring themes emerged identifying six interrelated dimensions of Individual Medical Readiness and their corresponding ideas (Reineck, 1998; 1999). The six inter-related dimensions were: (a) Clinical Nursing Competency, (b) Operational Competency, (c) Soldier/Survival Skills, (d) Personal/Psychosocial/Physical Readiness, (e) Leadership and Administrative Support, and (f) Group Integration and Identification. Reineck (1996) defines each dimension as follows:



### Clinical Nursing Competency

Technical proficiency, clinical competency with Table of Organization and Equipment (TO& E), non-equipment nursing skills, physical assessment, decision-making skills, trauma/triage skills, flexibility, emergency nursing skills, cross-training in other specialties, train as you fight, strong clinical leadership, developing skills for sustainment operations, identifying continuing education requirements, and ability to perform non-traditional roles.

### Operational Competency

Ability to perform skills in operational environment, understands mission and how to achieve it, knows health care delivery system on the battlefield, understands battlefield roles and processes that influence care, knows how things work in the austere field environment, can improvise, transfers nursing procedures to performing with field equipment, understands field environment, culture, and organization.

### Soldier Survival Skills

Understands the mission, training, survival skills, decision-making skills, weapons training, flexibility, planning skills, tactical proficiency, the equipment, soldier skills, the command structure, cross training in other specialties and non-traditional roles, proficient in using communication equipment, can train as you fight, knows how to support decision-makers, tactical proficiency, understands the operational role and capabilities of unit members, understands the flow of information and force protection.

### Personal/Psychosocial/Physical Readiness

Physically fit and mentally ready, capable of decision-making skills, is flexible, able to adapt to changing situations; has a proper mind set, carries a three month supply of medications, has strong leadership, personal stress relievers, has an ability to live with others, tolerates lack of privacy, provides peer support, practices time management, tough, realistic training, has family support and knowledge of security.

### Leadership and Administrative Support

Training, continual processing personnel for deployment; mandates physical fitness, workable and up to date family care plans, decision-making skills, flexibility, planning, proper mind set, understands the command structure, command support, understands role of sister services and the battlefield operating system, understands the mission, 3-6 month rotations to allow maximum experience for more personnel, family

support groups made attractive, standardizing an automated system to document readiness at the individual level.

### Group Integration and Identification

Ability to live and work with others and having the benefit of training with the unit before deployment (Reineck, 1996, pp. 23-24).

The six dimensions of individual medical readiness were operationally defined through the READI, a self-report measure designed to evaluate perceptions of Individual Readiness in Army Nurse Corps (ANC) personnel (Reineck, 1998). In a pilot study Reineck (1998) provided initial development and evaluation of the psychometric properties of the instrument. The original number of items representing each dimension, which have been restructured in the current study, and are detailed in Table 1.

Table 1

#### Scoring Plan for the READI

<u>Subscale</u>	<u># of items</u>	<u>Range of Scores</u>
Field Nursing Competency	36	36 - 154
Operational Competency	9	9 - 41
Soldier Survival Skills	12	12 - 60
Personal/Psychological/ Physical Readiness	34	34 - 100
Satisfaction with Leadership & Administration Support	5	5 - 25
Group Integration and Identification	4	4 - 20
TOTAL	100	100 - 400

From "Readiness instrument psychometric evaluation," by C. Reineck, 1998 Readiness estimate psychometric evaluation (Unpublished proposal), (p. 25). Adapted with permission of the author.

Following the qualitative techniques in phase one of Reineck's (1996) work, the TriService Nursing Research Program sponsored phase two of her study, designed, "...

to establish a valid and reliable instrument for indexing the degree to which army nursing personnel are prepared for the expectations and rigors of deployment” (Reineck, 1998, p. 1). Eight content expert raters, who were consulted on the project, used a methodology proposed by Waltz, Strickland, and Lenz (1991) to assess content validity of the measure. This methodology outlines a technique that evaluates scores designated by each expert on relevance, clarity and uniqueness for every instrument item. All eight raters (100%) evaluated the READI (Reineck, 1998) as understandable, presented in a suitable format with clear instructions, and indicating an adequate range of possible responses. Items of the READI (Reineck, 1998) were assessed as representative of the desired domain by 75% of the raters, with suggestions for items to be deleted or added.

Reliability estimates for internal consistency and test-retest were conducted in a sample of 225 Army nurses. Internal consistency reliability testing is employed when the concern is to measure the consistency of performance of one group of individuals across the items on a single measure. Cronbach’s alpha was used to express the extent to which items in a subscale are consistent in eliciting similar responses. An alpha coefficient of 0.70 or higher was considered acceptable. Reineck’s internal consistency and test-retest reliability estimates are presented in Table 2.

Table 2

Internal Consistency (Cronbach's alpha) and Test-Retest Reliability (Pearson r) for the READI (Reineck, 1998)

Total Sample = 225	Coefficient $\alpha$ N=196	Rtt (test-retest) N=149
	(87% of total)	(66% of total)
Clinical Competency	0.88	0.71
Operational Competency	Scale with only 2 items	0.48
Soldier/ Survival Skills	0.94	0.83
Personal/ Psychosocial/ Physical Readiness	0.48	0.78
Leadership & Administrative Support	0.77	0.69
Group Integration & Identification	Scale with only 4 items	0.69

( $p < 0.05$ )

Nunnally and Bernstein (1994) emphasized the importance of reliability to any measurement method. According to Nunnally and Bernstein (1994), a Cronbach Alpha coefficient  $> 0.70$  would be a good internal consistency estimate for a new measure. As presented in Table 2, the Operational Competency scale reliability was in the low to moderate range ( $r = 0.48$ ) due to a mixture of criterion-referenced knowledge questions with norm-referenced self-report of competence. Personal/Psychosocial/Physical Readiness scale internal consistency was also in the low to moderate range ( $\alpha = 0.48$ ) due to the heterogeneity of the items across three conceptual areas. Low internal consistency estimates for some subscales of the READI (Reineck, 1998) are an indication that ongoing evidence or revision is necessary to improve its reliability.

Test-retest reliability is a second measure historically used to provide evidence of measurement reliability. Waltz, Strickland and Lenz (1991) recommended the use of test-retest reliability in conjunction with the estimate of internal consistency when assessing qualities that remain stable over time. "For this reason, test-retest procedures

are usually employed for determining the reliability of affective measures” (Waltz, Strickland, & Lenz, 1991, p. 164). Test-retest reliability estimates were also conducted on the READI (Reineck, 1998) with a two-week time frame between assessments. Pearson product moment coefficients (Pearson  $r$ ) ranged from a low of  $r = 0.48$  for the operational competency subscale to a high of  $r = 0.83$  for the soldier/survival skills subscale. Again, test-retest reliability estimates for the READI were less than desirable on some of the subscales, an indication that ongoing evaluation is required to acquire satisfactory evidence. “Measures of low reliability cannot be depended upon to register true changes” (Cook & Campbell, 1979, p. 43). Therefore continued efforts to improve the psychometric properties of the READI (Reineck, 1998) was crucial for its further use.

Integral to the validation of a new measure is the process of construct validation. Since construct validation is never fully realized due to the abstract nature and complexity of constructs, ongoing evaluations must be conducted to learn more about the construct and to test its predictions (Portney & Watkins, 2000). There are several methods available to acquire this ongoing evidence. As part of the instrument validation process, selection of a measure with substantial evidence of its reliability and construct validity to test hypothesized relationships is critical (Strickland, 1999). Nunnally and Bernstein (1994) discussed a process of correlation with other measures as one method to collect evidence for construct validity of a new measure. One technique of evaluating such relationships is through convergent validation. Convergent validation “... is concerned with demonstrating that two independent methods of inferring an attribute lead to similar ends. This often involves correlating a new measure with an existing measure” (Nunnally & Bernstein, 1994, p. 92). The Derogatis Affects Balance Scale (DABS) (Derogatis, 1975; 1996a) which is a well-validated measure of the balance between individual positive and negative affective states and depicts a person’s state of well being, and the Brief Symptom Inventory-18(BSI-18) (Derogatis, 1993; 2000), a well-validated measure of psychological integration, will be used for convergent validation of the

READI-R-AFN and the READI-R-AFN [SF]. These instruments are discussed at length in Chapter 3.

### Summary

According to Samuels (1997), the modern political and military climate forecasts an ever-increasing frequency of humanitarian missions and contingency operations. As a result of an increase in international conflict and the increased frequency of contingency operations, military nurses have a greater possibility of participating in worldwide taskings, commonly known as deployments. An effective military force must be fully informed, trained, and prepared for such Military Operations Other Than War (MOOTW), in addition to the war missions they may ultimately face (Lillibridge, Burkle, & Noji, 1994). Military nurses therefore, must be prepared to mobilize in support of any worldwide tasking at any time. Historically, the deployment experience has resulted in inadequate preparation in the following areas: (a) Defining the knowledge and skills necessary to carry out procedural requirements, (b) understanding the importance of the military chain of command (leadership), (c) psychological factors associated with short and long term engagements involving geographic distance and physical separation from families, and (d) military inculturation processes (Concannon, 1992). The literature clearly demonstrates the stressful nature of the frequent deployment missions encountered by today's Air Force nurse.

Flannery's (1994) proposed theory of Stress Resistance was used to assess the components and items of the READI (Reineck, 1998) and provided a partial framework for the psychometric evaluation of the new Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN) and the Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form (READI-R-AFN [SF]). The new instruments were designed to test the self-perceptions of nurses' preparedness for military deployments. Psychometric evaluation involved testing the reliability and establishing validity of the measure in a specific sample of individuals. Therefore the

READI-R-AFN and the READI-R-AFN [SF] were tested in a sample of Air Force nurses considered worldwide qualified for mobility.

As part of the instrument validation process, it is necessary to include measures with substantial evidence of reliability and construct validity to test hypothesized relationships (Strickland, 1999). Nunnally and Bernstein (1994) discussed convergent validation as one technique toward construct validation of a new measure. Military nurses on deployment encounter stressful environments where emotions are aroused and well being is threatened. Therefore, self-report measures of emotional well being and psychological distress are the observable variables that will be correlated with the hypothesized measure of the construct of Individual Medical Readiness, measured by the READI-R-AFN and the READI-R-AFN [SF]. The Derogatis Affects Balance Scale (DABS) (Derogatis, 1975; 1996a) which is a well-validated measure of affects balance (an indicator of well being), and the Brief Symptom Inventory-18 (BSI-18) (Derogatis, 1993; 2000), which is a well-validated measure of psychological distress, were used for convergent validation of the READI-R-AFN and the READI-R-AFN [SF].

## CHAPTER III METHODS

### Introduction

The methodology of sampling procedures, selection of settings and instruments used for construct validation of the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN) and the READI-R-AFN Short Form [SF] was based on the framework addressed by classical test theory (Nunnally, 1978).

Measurement of data included a well delineated process of instrument development.

Protection of human subjects was assured by adherence to guidelines of University of Maryland's Institutional Review Board and Air Force institutional review boards.

Variables under study are explained and procedures for instrument validation are described. In addition the analytic approach is delineated, to include an overview of structural equation modeling. Limitations of the study conclude the chapter.

### Research Design and Procedures

The purpose of this study was to use a test development strategy to establish the psychometric properties of the READI-R-AFN and the READI-R-AFN [SF] in a sample of Air Force nurses deemed worldwide qualified for deployment missions. A nonprobability, purposive sampling, cross-sectional survey design was employed for collection of data. The study was conducted in two phases. Phase one was conducted as a



pilot study in a convenience sample of nurses stationed at an Air Force Medical Center located in the Southwestern United States. Phase two, the Full Field Test, involved participants located at the three largest United States Air Force Medical Centers (one on the East Coast, one in the Midwest, and one on the West Coast). Large Medical Centers provided the number of participants required for this study and offered a representative sample of all active duty Air Force Nurses.

### Sampling Plan

The time period for the pilot study was from October 1, 2000 to December 31, 2000. Active duty Air Force nurses designated as worldwide qualified for deployment missions were included in this study. Specific inclusion/exclusion criteria for all phases of the study were that each nurse was: (a) 21 - 60 years of age and (b) worldwide qualified for mobility.

### Phase I - Pilot Study

Phase I or the pilot study of the READI-R-AFN was based on a purposive sample of 350 active duty Air Force nurses located at a large Air Force Medical Center in the southwestern United States. One hundred eighty one (181) nurses responded to the questionnaires in the pilot study for a response rate of fifty-two (52) percent. A 52% response rate resulted in a representative sample of active duty Air Force nurses and provided a sufficient number needed for confirmatory factor analysis of the READI-R-AFN through structural equation modeling techniques (Stevens, 1996). When evaluating a measurement model with confirmatory factor analysis, Bollen (1989) observed models would not converge on samples less than  $N=150$ , nor with only two indicators per factor. In addition, a small sample can reduce the power of a test, since the power of a test

increases as the sample (N) increases (Bollen, 1989). Indicators for each subscale of the READI-R-AFN ranged from 6 to 28 items.

A nurse researcher on location facilitated the process of locating all nurses stationed at the medical treatment facility who met the study criteria to provide them the opportunity to take part in the study. The nurse researcher contacted nurses who were willing to take part in the study and provided each with a packet consisting of a consent form and three questionnaires with instructions. The purpose, nature, and procedures of the study were explained to each participant. Consent forms were signed and were placed in a stamped envelope and were mailed separately to the Principal Investigator. The completed questionnaires were returned to the liaison nurse researcher in a separate envelope provided to the participants. Once all questionnaires were returned to the liaison nurse researcher they were mailed in bulk to the Principal Investigator for analysis. Following data entry, the questionnaires were placed in a locked cabinet in the Principal Investigator's office.

The READI-R-AFN was also administered to a random sample of 30 participants one week after the first administration for test-retest reliability estimates. Seven (7) nurses completed and returned the READI-R-AFN a second time. This is an insufficient sample size to obtain meaningful results in a repeated measures design. In a repeated measures design, a sample of 17-44 subjects per group, a large effect size (.15) and an alpha of .05 is needed to yield an estimated power of 80% (Keppel, 1991). Therefore, reliability estimates for deriving the READI-R-AFN [SF] were obtained primarily

through evaluation of internal consistency (coefficient alpha) and squared multiple correlation coefficients ( $R^2$ ).

#### Phase II - Full Field Test

Phase II or the Full Field Test was based on a sample of 500 active duty nurses stationed at three different Air Force bases across the United States and is representative of all active duty Air Force nurses according to Air Force demographic statistics, based upon electronic mail correspondence with the Air Force Personnel Center (AFPC). The sample was acquired by consultation with the Air Force Medical Readiness Headquarters and a nurse researcher at each Air Force Medical Center. A total of 500 questionnaires were distributed. When performing structural equation modeling, complexity of the model impacts the size of the sample required. A sample size over 200 is considered sufficiently large (Kline, 1998). A nurse researcher at each base was contacted to assist with the initial approach to Air Force nurses in each convenience sample. The sample, divided according to availability at each medical center, included: (a) 182 nurses located at Travis AFB, California, (b) 143 nurses at Andrews AFB, Maryland and (c) 175 nurses at Wright-Patterson AFB, Ohio.

A nurse researcher at each location informed each participant that they would be contributing to the development of a new instrument for self-assessment of individual preparedness for deployment. Written communication from the Principal Investigator informed them that their participation involved anonymously completing several forms as a self-evaluation of individual preparedness. In addition, they would be asked several basic demographic questions (e. g. age, years of nursing experience, gender, training,

deployment and mobility status, and techniques of coping with deployment stress).

Thirty respondents at each site were further instructed that one week following the day they completed the initial READI-R-AFN [SF], DABS (Derogatis, 1975; 1996a), and BSI (Derogatis, 2000), they should complete and return the READI-R-AFN [SF] a second time as part of the test-retest reliability procedure.

Each participant was informed anonymity would be maintained by assignment of a randomly determined ID number, which would be the sole means of their identification in the study database. They were instructed that their names would never appear on any study test forms, or electronically in the study database. Each participant was given a space to briefly communicate his/her experience with the READI-R-AFN [SF] if desired. The questionnaires were returned to the nurse researcher at each study location, and were then forwarded to the Principal Investigator through bulk mailing. Once all study forms were received, reporting was presented in the aggregate, with no linkage between names and study ID numbers (i.e. database record).

#### Instruments

Three instruments were used in this study for the evaluation of self-perception of preparedness for deployment. The Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN) (Pilot Study), the READI-R-AFN Short Form [SF] (Full Field Test), the Derogatis Affects Balance Scale (DABS) (Derogatis, 1975; 1996a), and the Brief Symptom Inventory-18 (BSI-18) (Derogatis, 1993; 2000).

#### Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN)

The initial form of Reineck's (1998) questionnaire, the READI as shown in Appendix 1, was modified to incorporate Air Force terminology for development of the

Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN). Specific subsections were revised with the assistance of nurses experienced in Air Force deployment missions. The instrument was modified to produce a prototype instrument that appropriately samples the content domain, or concepts included in the construct of interest (in this case, 'perceived state of readiness in Air Force nurses'). Items in several dimensions were expanded and standardized for uniformity as part of the ongoing development process of the READI-R-AFN shown in Appendix 2.

The first draft of the instrument was mailed electronically to thirty Air Force nurses who had prior deployment experience. Nurses with deployment experience evaluated the questionnaire for clarity, simplicity, redundancy, applicability, and comprehensiveness; and were asked to identify any confusion about specific items. Following completion of the instrument, these nurse experts were asked to comment on items and offer suggestions for improvements. The original items were revised according to feedback provided. For example, recommendations were made for rewording items and adding an item to address making arrangements for pets if the Air Force nurse were to be deployed.

#### Content Validity

Following feedback on the READI-R-AFN from Air Force nurses with deployment experience, experts were consulted to evaluate the applicability of the measure and to ensure items selected were representative of the desired domain. Three experts who were involved in Air Force Medical Readiness procedures were identified as the most qualified experts to evaluate the measure. Agreement among experts was determined by conducting a content validity index (CVI) score using predetermined criteria to rate relevance for each item (Waltz, Strickland, & Lenz, 1991). Experts were given a

blueprint of objectives and content used to guide the development of the scale. Using the blueprint as a guide, experts were asked to rate the relevance of the items to the content by assigning each item a score using a 4-point rating scale: (1) not relevant; (2) somewhat relevant; (3) quite relevant; and (4) very relevant. "The CVI is defined as the proportion of items given a rating of quite/very relevant by raters involved" (Waltz, Strickland, & Lenz, 1991, p. 173). There was 100% agreement by the three experts on items rated as quite/very relevant. A CVI of 0.80 or greater is considered an acceptable estimate of content validity (Waltz, et. al, 1991). Items not rated as quite/very relevant were revised based on feedback from the expert panel, including addition of items the experts recommended would be a better assessment of the domain of Individual Medical Readiness. The revised items were organized in a standardized, Likert format and administered untested in the sample selected for the pilot study of the measure.

Each item on the READI-R-AFN was measured on a five-point Likert type scale, ranging from 1 = 'not competent' or 'totally disagree' to 5 = 'totally competent', or 'totally agree'. Six primary dimensions comprised the measures of the construct of individual medical readiness (IMR), which reflect conceptual components of an individual's perceived state of readiness. The READI-R-AFN dimensions resulted in six global scores designed to communicate a summary picture of the individual's overall perceived state of readiness for deployment. The Clinical Nursing Competency dimension contained the largest number of items as a result of the greater emphasis in the literature on the need for nurses to be adept clinically to perform in a deployment environment (Stanton-Bandiero, 1998). The Personal/Psychosocial/Physical Readiness dimension also contained more items due to the need to address content of three

conceptual areas. Table 3 depicts the number of items and range of scores for each dimension of the modified version of the READI (Reineck, 1998), the READI-R-AFN.

Table 3

Scoring Plan for the READI-R-AFN

<u>Subscale</u>	<u># of items</u>	<u>Range of Scores</u>
Clinical Nursing Competency (Items 1-28)	28	28 - 140
Operational Competency (Items 29-37)	9	9 - 45
Soldier Survival Skills (Items 38-47)	10	10 - 50
Personal/Psychosocial/ (Items 48-71) Physical Readiness	24	24 - 120
Satisfaction with Leadership & (Items 72-77) Administration Support	6	6 - 30
Group Integration and Identification (Items 78-83)	6	6 - 30
TOTAL	83	83 - 415

Derogatis Affects Balance Scale (DABS)

Affects balance, which specifically pertains to an individual's level of positive and negative affect, emotion or mood, is the variable operationalized through the Derogatis Affects Balance Scale (DABS) (Derogatis, 1975; 1996a), as pictured in Appendix 3. The primary structure of the DABS (Derogatis, 1996b) was built on the premise that positive and negative affectivity are independent dimensions of the human emotional experience. Positive affectivity is conceptualized by feelings of high energy and enthusiasm, which enable the individual to focus on goals and interact in a pleasurable manner with the surrounding environment. Negative affectivity is conceptualized as a construct of psychological distress resulting in the individual's demonstration of behaviors of anger,

depression, and anxiety. This behavior can progress to a state of negative affects, ineffective coping, and the depreciated self-concept observed in individuals with psychiatric disorders (Derogatis & Rutigliano, 1998). "The most sensitive indicator of impaired well-being has consistently been shown to be affective dysregulation, and affects balance is the central measurement construct of the DABS" (Derogatis & Palmer, 1998, pp. 90-91).

The overall dimensions of the DABS reflect two primary affective components: positive affects and negative affects. The DABS' 40 adjectives are categorized into twenty representative of positive emotions and twenty representative of negative emotions. Five adjectives pertain to each of the eight affect dimensions (The four positive dimensions of affect are identified as joy, contentment, vigor and affection. The negative dimensions of affect are identified as anxiety, depression, guilt and hostility). Each item on the DABS is measured on a five-point Likert type scale, ranging from 0 = "never" to 4 = "always". Eight primary dimensions and five global scores comprise the measures of affectivity and affects balance, which reflect basic individual emotional states. The DABS results are summarized in five global scores designed to communicate a summary picture of the individual's emotional status and well being.

The DABS (Derogatis, 1996a) is a multidimensional self-report affects and moods inventory that "represents a highly valid characterization of personal well being" (Derogatis, 1996a, p.1). It has been utilized as a sensitive indicator of well being and positive psychological integration in numerous medical and community populations (Derogatis, 1996b). Internal consistency (coefficient alpha) ranges from 0.84 to 0.94 for the subscale and global dimensions of the DABS (N=355). Test-retest reliability for the global measures of the DABS range from  $r = 0.80$  to  $0.87$ . Several validation studies of the DABS have been conducted establishing the internal structure of the instrument (Derogatis, 1996a). Coefficient alpha of the DABS overall scale in the current sample was 0.82, which is similar to internal consistency results found in prior samples. In



addition, subscale scores for DABS positive affects total (PTOT), DABS negative affects total (NTOT), DABS affects balance index (ABI), DABS affects expressiveness index (AEI) and DABS positive affects ratio (PAR) are similar to the range of scores found in community samples.

In practice, the DABS (Derogatis, 1996b) was found to be an early indicator of impending symptomatic distress. A well-established instrument to measure the occurrence of symptomatic or psychological distress is the Brief Symptom Inventory-18 (BSI-18) (Derogatis, 1993, 2000).

#### The Brief Symptom Inventory-18 (BSI-18)

The Brief Symptom Inventory (BSI) is well documented as a sensitive indicator of psychological distress in numerous clinical and research settings (Cochran & Hale, 1985; O'Hara, Ghonheim, Heinrich, Metha, & Wright, 1989; Kornblith, Anderson, Cella, Tross et al., 1992; Piersma, Reaume, & Boes, 1994; Sparks, Farran, Donner & Keane-Hagerty, 1998). The BSI (Derogatis, 1993) is an instrument comprised of 53 items for the assessment of psychological distress that yields three general scores and nine specific subscale scores. The nine subscale dimensions include somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychotocism. Internal consistency (Cronbach's alpha) ranges from 0.75 to 0.85 on the nine dimensions of the BSI. The Global Severity Index (GSI) is the total score obtained on the BSI (Derogatis, 1993). The GSI "... represents the most sensitive single quantitative indicator concerning the respondent's overall psychological distress status" (Derogatis & Savitz, 1999, p. 685). Test-retest reliability of the nine dimensions range from 0.68 to 0.91 with a stability coefficient of  $r = 0.90$  for the Global Severity Index of the BSI (Derogatis, 1993).

The BSI has been validated in large normative samples and has been shortened to an 18-item version (Derogatis, 2000; Derogatis & Lynn, 1999). The 18-item version of the BSI, the BSI-18, shown in Appendix 4, was used in this study and includes six items

each on the dimensions of somatization, depression and anxiety (Derogatis, 2000). Internal consistency reliability coefficients for the BSI-18 conducted in a community sample of 1,134 participants range from alpha coefficients of 0.79 to 0.89, and are well above the 0.70 estimates considered acceptable (Nunnally & Bernstein, 1994). Test-retest reliability estimates are based on high correlations of the BSI-18 (Derogatis, 2000) with the original BSI (Derogatis, 1993).

Recent studies have utilized the BSI to document levels of psychological distress in military personnel in deployed settings. The studies have shown a greater incidence of psychological distress in individuals in deployed settings (Rosen & Martin, 1996; Rosen, Wright, Marlowe, Bartone, & Gifford, 1999; Stretch, Knudson, & Durand, 1998; Stretch, Marlowe, Wright, Bliese, Knudson, & Hoover, 1996; Stuart & Halverson, 1997; The Iowa Persian Gulf Study Group, 1997). Coefficient alpha results in the current sample with the BSI-18 overall scale was 0.91, and also is similar to internal consistency results found in prior community samples tested with this measure. In addition, the BSI-18 subscale scores for somatization (SOM), depression (DEP), anxiety (ANX) and global severity index (GSI) are similar to the range of scores found in community samples.

#### Reliability and Validity Testing of READI-R-AFN

The Pilot study was designed to evaluate the responses of a small group of representative respondents to the prototype instrument. The principal goal of Phase I was to evaluate the reliability and validity of the READI-R-AFN in a large sample of active duty Air Force nurses and to develop the READI-R-AFN Short Form [SF] if indicated through:

1. Discriminant validation – (high vs. low well-being and distressed vs. non-distressed samples).

2. Discriminant validation – (high percent perceived state of readiness vs low percent perceived state of readiness).
3. Confirmation of the hypothesized nature of the test structure via confirmatory factor analysis.
4. Completion of expanded reliability studies (internal consistency, test-retest, &  $R^2$ ).

#### Reliability and Validity Testing of READI-R-AFN [SF]

Phase II was initiated with the revised version of the prototype, the READI-R-AFN [SF] which involved modifications associated with item phrasing and item content ambiguities discovered in Phase I evaluations. The principal goal of Phase II was to test the reliability and validity of the revised READI-R-AFN [SF] in a large sample of active duty Air Force nurses who were worldwide qualified for mobility through:

1. Discriminant validation – (high vs. low well being and distressed vs. non-distressed samples).
2. Discriminant validation – (high percent perceived state of readiness vs low percent-perceived state of readiness).
3. Confirmation of the hypothesized nature of the test structure via confirmatory factor analysis using structural equation modeling.
4. Completion of expanded reliability studies (internal consistency, &  $R^2$ );
5. Accomplish comprehensive convergent validation studies with the Derogatis Affects Balance Scale (DABS) (Derogatis, 1975; 1996a), and the Brief Symptom Inventory-18 (BSI-18) (Derogatis, 1993; 2000).

### Protection of Human Subjects

Prior to the initiation of this study, a copy of the proposal was provided and written approval was obtained from the Institutional Review Board (IRB), at the University of Maryland, Baltimore as shown in Appendix 5a. After this approval, written permission was sought to conduct this study at four large United States Air Force Medical Treatment Facilities through each IRB and the Uniformed Services University of the Health Sciences (USUHS) as shown in Appendix 5b through 5j. Prior to administration of any questionnaires, eligible participants were informed in writing of the right to refuse to take part in the study. With the decision to take part in the study, participants were assured of anonymity.

### Overview of Structural Equation Modeling

Structural equation modeling (SEM) was the main analytic procedure employed in this study. Primarily, structural equation modeling comprises the evolvement of a hypothesized 'causal' explication of a phenomenon of interest dependent on related phenomena, and the application of statistical procedures for testing the model. Structural modeling consists of measurement equations and structural equations (Brown, 1992). The measurement equation represents the relationship between the measured variables and the theoretical constructs, i.e. latent variables, which are accepted as the underlying concepts of the measured variables. "This set of equations allows one to assess the accuracy of proposed measurements. The structural equations express the hypothesized relationships, which allow the assessment of the proposed relationships among observed variables and latent constructs" (Brown, 1992, p. 326). Structural equation modeling allows the researcher to evaluate whether assumptions made for reliability coefficients are

statistically defensible (Reuterberg & Gustafsson, 1992). SEM can then help determine the extent a measure is reliable: "... the researcher can distinguish between problems of imperfect measurement of variables and problems from misspecification of the theoretical model" (Musil, Jones, & Warner, 1998, p. 276).

Confirmatory factor analysis (CFA) is a procedure that gives the researcher information about the extent to which a set of items measures the same underlying construct or dimension of a construct (Tabachnick & Fidell, 1996). Items designed to measure the same dimension should load on the same factor. This analysis is used to indicate whether items in an instrument reflect a single construct or several constructs. Structural Equation Modeling (SEM) is a statistical technique that allows the researcher to evaluate both measurement models and path models (Kline, 1998).

#### Steps of Analytic Plan

The Statistical Package for the Social Sciences Version 10-0 software program (SPSS, 1998) was used to analyze data. Amos 4.0 (Arbuckle & Wothke, 1999) was the statistical software used to conduct structural equation modeling statistical techniques include Confirmatory factor analysis (CFA).

#### Missing Data

For the Pilot Study, detection of errors in data entry and missing data was initiated with a general inspection of the data to make sure that there were no errors in entry and that the values were within plausible ranges. By running exploration and looking at the highest and lowest extreme values for each continuous variable, it was noticed that thirty-two (32) variables on the READI-R-AFN had missing data. These were only .002 percent of data points in the entire data set, and were scattered randomly throughout the

data matrix. In addition, 6 respondents (3% of the sample) failed to complete a BSI-18 or DABS and were not included for convergent validation of the READI-R-AFN.

According to Tabachnick and Fidell (1996) if data are missing only a few points and are scattered randomly throughout the data set, it is not a serious problem and any method of handling missing values would achieve similar results. The mean of each subscale was calculated individually and imputed for each missing data point since it is acceptable with small amounts of randomly missing data (Tabachnick & Fidell, 1996). In a recent dissertation comparing missing value imputation methods with Likert type measures, Zhou (2001) found very little difference in the model chosen to impute scores when missing items or subjects missing values were less than ten percent.

#### Normality of Distribution and Linearity

Normality of distribution is an essential assumption for structural equation modeling (SEM) analysis. Since sum scores are used in the Likert scales of each questionnaire, the items are treated as continuous variables in the data set. Data were explored for the normality assumption and special attention was paid to the degree of skewness and kurtosis of each variable's distribution. The variables of the summed subscales, the Personal/Psychosocial/Physical (PPP) and Leadership and Administration (LA) subscale scores violated the normality assumption due to skewness and/or kurtosis (z scores of more than 3). These were transformed through the use of transformation techniques including reflect, logarithm and square root transformations for data which exhibited negative skewness, and reciprocal and natural log to correct for positive skewness and kurtosis. Skewness of the distributions did not improve with

transformations, thus data were analyzed with nontransformed variables for subsequent analyses.

### Outliers

An exploration for univariate outliers on the list of the continuous variables was also performed. Looking at the Boxplots and the Stem-and-Leaf plots, cases with outliers on a given variable were identified. Outliers were found in all variables. Multivariate outliers were also tested using the Mahalanobis distance test. There are many approaches for the management of outliers. Checking for errors in data entry (Stevens, 1996) is one method that was applied in this dataset. The choice of dropping cases with outliers was not considered because it limits generalization of inferences and because tossing out cases is a suspicious procedure (Tabachnick & Fidell, 1996).

### Multicollinearity

Variables were evaluated for the presence of multicollinearity, which is problematic when performing factor analysis and SEM. Multicollinearity occurs when two variables in a correlation matrix are highly correlated with each other ( $\geq 0.9$ ) and they show the same pattern of correlation with the other variables. Presence of multicollinearity between variables leads to redundancy in explaining the variance on the dependent variable and limits the size of variance (since variables account for the same variance). A check for multicollinearity on the continuous variables was performed with a Pearson Correlation Coefficient. Two variables, gii79 and gii80, violated the multicollinearity assumption and both were eliminated from the measure since neither item fit well with the remaining group integration items. Both items addressed training

prior to deployment, which is also addressed in the demographic portion of the questionnaire. Therefore, items on training were eliminated from the Group Integration and Identification subscale.

#### Item and Scale Level Statistics

The statistics evaluated included both item and scale level estimates as well as psychometric properties. The item level measures included the estimates of item mean, SD, and correlation coefficient. The scale level measures included the estimates of scale mean, SD, and correlation among the scales. Psychometric measures, which are derived from the item level variance-covariance matrices, included reliability and factor structure. Means, SDs and correlation coefficients were estimated using SPSS version 10 under each data condition.

Internal consistency reliability (coefficient alpha) is estimated based on the average correlation among items within a scale. This measure reflects both the number of items and their average correlation (Nunnally & Bernstein, 1994),  $\alpha = \frac{k}{k-1} \{1 - \frac{\sum \sigma^2_i}{\sigma^2_y}\}$ , where  $k$  is the number of items in the scale,  $\sigma^2_i$  is the individual item variance (error variance), and  $\sigma^2_y$  is the total variance.

As noted above, three forms of reliability estimates were performed. Preliminary internal consistency was estimated using Cronbach's alpha and test-retest reliability estimates using Pearson Correlation Coefficients (Stevens, 1996). The results, displayed in Table 4, reveal all alpha levels  $\geq 0.70$  which gives evidence of internal consistency of each subscale and the total scale, indicating performance on the initial test was a good indicator of performance on the retest (Nunnally & Bernstein, 1994). Thirty retests were



administered as part of the pilot study, but only 7 respondents completed the retest. As a result of the small sample size, results are not meaningful for test-retest reliability. This lack of response with test-retest provided further support for the need to employ alternative methods for evaluating reliability of the READI-R-AFN.

Table 4

Internal Consistency and Test-Retest Results for the READI-R-AFN

<u>Subscale</u>	<u>Coefficient <math>\alpha</math></u>	<u><math>R_{tt}</math> (test-retest)</u>
Total Sample = 181	<u>N=181</u>	<u>N=7</u>
Clinical Competency	0.96	0.98
Operational Competency	0.92	0.94
Soldier/Survival Skills	0.95	0.96
Personal/ Psychosocial/ Physical Readiness	0.92	0.86
Leadership & Administrative Support	0.86	0.86
Group Integration & Identification	0.80	0.97

( $p < .05$ )

Retaining Reliable Items for the READI-R-AFN [SF]

A nonsignificant chi square ( $\chi^2$ ) is desired as an indication that the model fits the data because it is a lack of fit statistic, so if nonsignificant, it indicates the proposed model resembles the data (Stevens, 1996; Stuijbergen, Seraphine, & Roberts, 2000). When accounting for the ratio of  $\chi^2$  to degrees of freedom (df), a ratio less than 3 is considered an estimate of good fit (Bollen, 1989). Since chi square results are extremely sensitive to sample size, the best way to assess model fit has been a subject of much discussion

(Stevens, 1996). As a result “... a plethora of fit statistics has been developed and discussed in the literature” (Stevens, 1996, p. 402). Therefore, a few of the most commonly recommended comparative fit statistics were used to assess model fit, such as the standardized residuals (RMSEA), the normed fit index (NFI), and the Bentler comparative fit index (CFI) (Kline, 1998). The NFI depicts the change in fit gained by using the hypothesized model relative to the fit of the null model. Values between zero and one (1) are desired, with higher numbers indicating better fit (Stevens, 1996). The Bentler comparative fit index (CFI) indicates proportion of explained variance is adjusted for model complexity and should have results  $> 0.90$  (Kline, 1998). In addition, the root mean square of approximation (RMSEA) pertains to correlation residuals in the model and values greater than  $|.10|$  is an indication of lack of fit (Kline, 1998). Therefore, in addition, to evaluating each of the subscales for internal consistency and test-retest reliability, squared multiple correlations  $\geq 0.50$  and lambda values  $\geq 0.70$  were used to retain items on the READI-R-AFN (Bollen, 1989). See Appendix 6 for the Table summarizing results of reliability estimates using SEM. Measurement models shown in Figure 2, Figure 3, Figure 4, Figure 5, Figure 6, and Figure 7 were used as input in AMOS version 4 (Arbuckle & Wothke, 1999) to calculate estimates. The revised version of the Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form (READI-R-AFN [SF]) is shown in Appendix 7.

### Validity

Confirmatory Factor Analysis (CFA) was used for validity estimation (Stevens, 1996), and performed to assess the underlying domain structure of the READI-R-AFN

and the READI-R-AFN [SF]. This technique was also used to evaluate factorial validity, i.e. the degree to which each item is related to the hypothesized domain with which it is linked, and for confirmation of the dimensional structure of the READI-R-AFN and the READI-R-AFN [SF] (Stevens, 1996).

As part of convergent validation of the instrument to provide further support for construct validity, readiness scores were evaluated as a function of indicators of emotional well being and psychological distress using the DABS (Derogatis, 1975; 1996a), and the BSI-18 (Derogatis, 2000). Bivariate statistical analyses were performed to compare scores on the READI-R-AFN with scores on the DABS (Derogatis, 1975, 1996a) and scores on the BSI-18 (Derogatis, 1993; 2000). Structural Equation Modeling (SEM) was used to estimate the validity of the READI-R-AFN by calculating an estimate of the correlation of the measure with its latent variable, Individual Medical Readiness (Bollen, 1989). A sample covariance matrix was used as input and a maximum likelihood solution was pursued. Results of this analysis are discussed in Chapter IV. Item p levels, were also included to address validity of the item (Waltz, Strickland, & Lenz, 1991). The item P level is calculated as the number of subjects who select the most desired response on each item. Since the READI-R-AFN was designed as a self-assessment of preparation for deployment, it was determined that individuals who classified themselves as totally prepared (5 on each scale) would be selecting the most desired response. The number of individuals who gave the desired response was then divided by the total sample to calculate the item P level. Levels between .30 and .70 are desirable for norm-referenced measures (Waltz, Strickland, & Lenz, 1991). Appendix 6 provides a summary table of item P level results.

## Measurement Models for Analysis

Factor structure was evaluated using structural equation modeling (SEM) through specification of a measurement model based on a priori hypotheses regarding relationships among and between observed measures and their underlying latent constructs (Kline, 1998). A structural model is expressed in a matrix equation form as  $X = \Lambda_x \xi + \delta$ ; where  $X$  is a  $(NX * 1)$  column vector of observed variables;  $\Lambda_x$  is a  $(NX * NK)$  matrix of structural coefficients;  $\xi$  is a  $(NK * 1)$  column vector of latent variables;  $\delta$  is a  $(NX * 1)$  column vector of measurement error terms associated with observed variables;  $NX$  denotes the number of observed variables  $X_j$ ; and  $NK$  denotes the number of latent constructs  $\xi_s$  (Bollen, 1989).

In this study, indicators are specified to load on six latent factors with the READI-R-AFN. Modification to the READI-R-AFN was made based on SEM estimates. No modification to the BSI-18 and DABS measurement models is made because testing these models was not the purpose of this study. The BSI-18 and DABS were used for convergent validation of the READI-R-AFN [SF] with bivariate correlations.

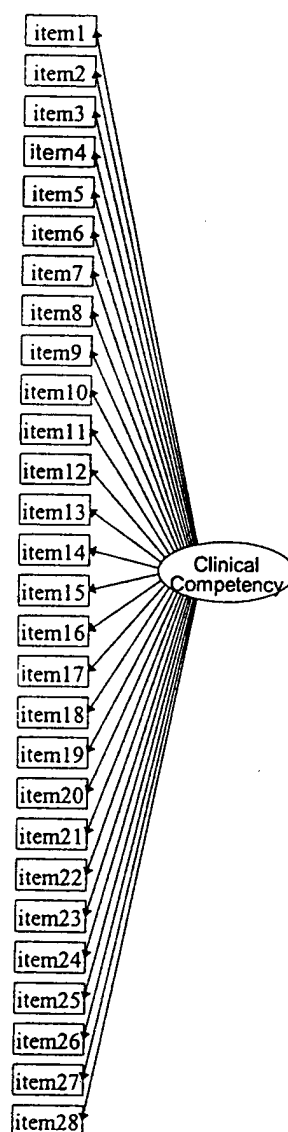
In the following pages the description of each subscales and related items of the six dimensions of the READI-R-AFN and the READI-R-AFN [SF] are presented with each measurement model. These item numbers reflect specific questions which were taken from the READI-R-AFN and READI-R-AFN [SF] as indicators that would load on each of the latent factors.

### Clinical Nursing Competency Subscale

The measurement model for Clinical Nursing Competency is depicted in Figure 2. Twenty-eight items or questions related to clinical nursing skills were specified as the observed variables for the underlying latent construct of Clinical Competency. Specific items hypothesized to relate to the dimension of Clinical Nursing Competency are shown in the READI-R-AFN in Appendix 2.

Figure 2

### Measurement Model of READI-R-AFN Clinical Competency

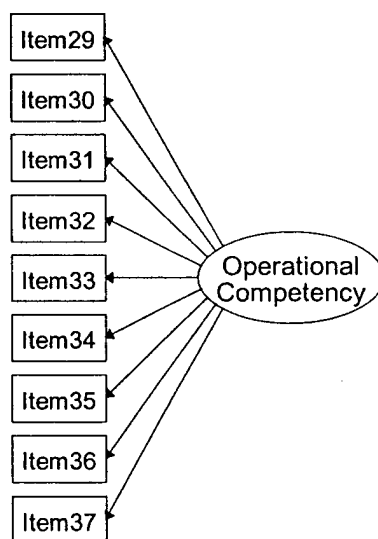


### Operational Nursing Competency

The measurement model for Operational Competency is depicted in Figure 3. Nine items or questions related to field nursing skills were specified as the observed variables for the underlying latent construct of Operational Competency. Specific items hypothesized to relate to the dimension of Operational Competency are shown in the READI-R-AFN in Appendix 2.

Figure 3

#### Measurement Model of READI-R-AFN Operational Competency

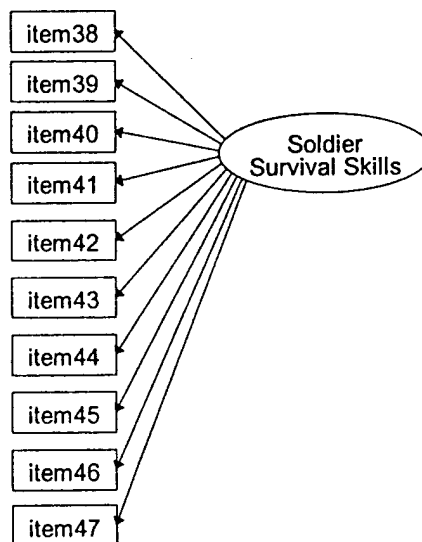


### Soldier Survival Skills

The measurement model for Soldier Survival Skills is depicted in Figure 4. Ten items or questions related to survival skills expected of Air Force personnel were specified as the observed variables for the underlying latent construct of Soldier Survival Skills. Specific items hypothesized to relate to the dimension of Soldier Survival Skills are shown in the READI-R-AFN in Appendix 2.

Figure 4

#### Measurement Model of READI-R-AFN Soldier Survival Skills

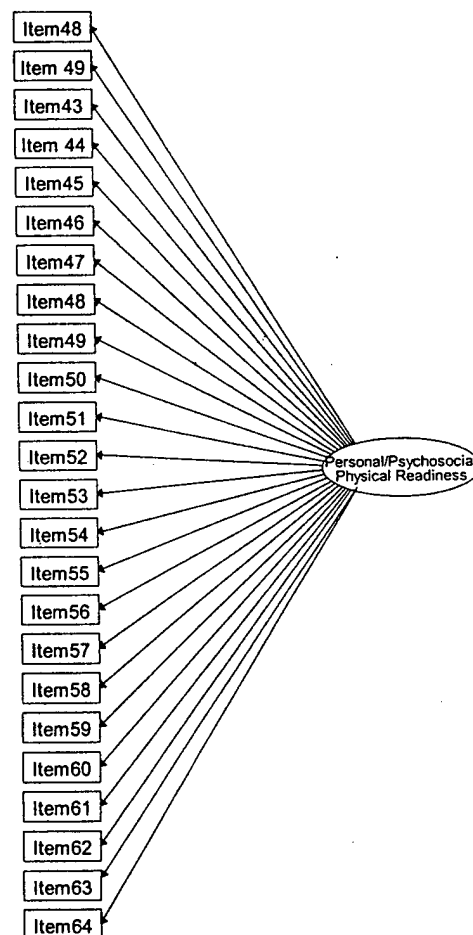


Personal/Psychosocial/Physical Readiness

The measurement model for Personal/Psychosocial/Physical Readiness is depicted in Figure 5. Twenty-four items or questions related to deployment preparation expected of Air Force personnel were specified as the observed variables for the underlying latent construct of Personal/Psychosocial/Physical Readiness. Specific items hypothesized to relate to the dimension of Personal/Psychosocial/Physical Readiness are shown in the READI-R-AFN in Appendix 2.

Figure 5

Measurement Model of READI-R-AFN Personal/Psychosocial/Physical Readiness



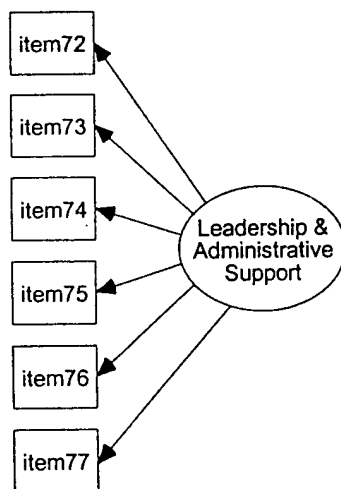


### Leadership and Administrative Support

The measurement model for Leadership and Administrative Support is depicted in Figure 6. Six items or questions related to satisfaction with leadership and administrative support were specified as the observed variables for the underlying latent construct of Leadership and Administrative Support. Specific items hypothesized to relate to the dimension of Leadership and Administrative Support are shown in the READI-R-AFN in Appendix 2.

Figure 6

#### Measurement Model of READI-R-AFN Leadership and Administrative Support

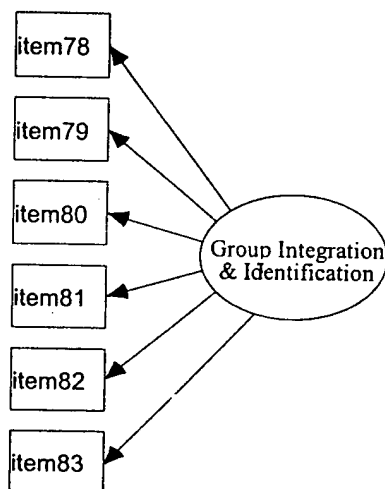


### Group Integration and Identification

The measurement model for Group Integration and Identification is depicted in Figure 7. Six items or questions related to ability to live and work in close proximity of coworkers were specified as the observed variables for the underlying latent construct of Group Integration and Identification. Specific items hypothesized to relate to the dimension of Group Integration and Identification are shown in the READI-R-AFN in Appendix 2.

Figure 7

#### Measurement Model of READI-R-AFN Group Integration and Identification

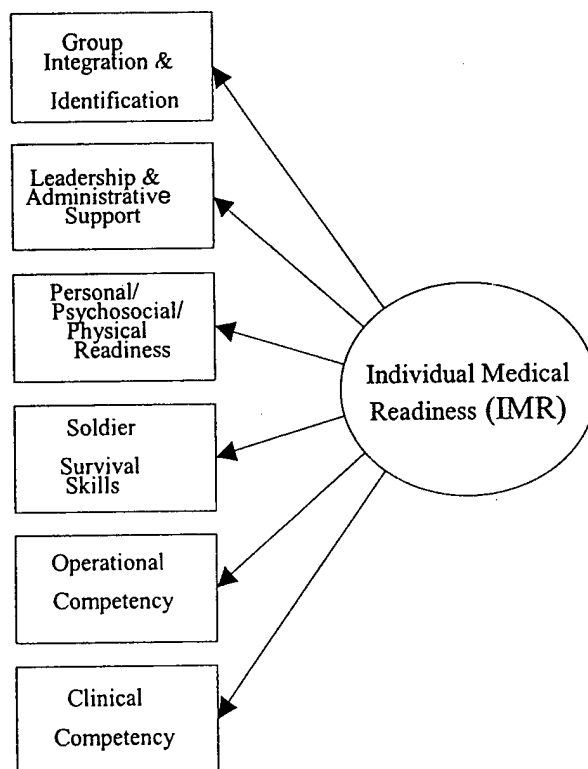


### Measurement Model of READI-R-AFN & READI-R-AFN [SF]

The Measurement Model for the full READI-R-AFN and the READI-R-AFN [SF] using the six summed subscales of each latent variable were specified as the observed variables for the latent construct of Individual Medical Readiness (IMR).

Figure 8

### Measurement Model of READI-R-AFN & READI-R-AFN [SF]



### Measurement Model of Individual Medical Readiness (IMR)

AMOS Version 4.0 (Arbuckle & Wothke, 1999) was used to perform the CFA. Goodness of fit statistics, including  $\chi^2/\text{df}$  ratio, REMSEA and goodness of fit indices were compared in addition to the parameters of factor loadings ( $\Lambda$ ) and factor correlations ( $\Phi$ ).

## Summary

This study employed a test development strategy for evaluation of the psychometric properties of the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN) and the Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form (READI-R-AFN [SF]) in a representative sample of Air Force nurses deemed worldwide qualified for deployment missions using a cross-sectional survey design. The study was conducted in two phases to complete psychometric evaluation of the READI-R-AFN and the READI-R-AFN [SF]. Phase I, or the Pilot Study accomplished an evaluation of the initial version of the instrument as a means to refine the READI-R-AFN to a shorter version for rapid administration, the READI-R-AFN short form [SF]. Phase II, or the Full Field Test evaluated the reliability and validity of the revised version of the READI-R-AFN, the READI-R-AFN [SF] in a large sample of active duty Air Force nurses.

## CHAPTER IV RESULTS

### Introduction

The purpose of this study was to modify the Readiness Estimate and Deployability Index (READI), an instrument developed by Reineck (1998), and to test the reliability and validity of the modified READI-R-AFN in a pilot study with a large sample of active duty Air Force nurses. The results of the pilot study were used to revise the READI-R-AFN to form a shorter version of the measure, which was labeled as the READI-R-AFN [SF]. The psychometric properties of the READI-R-AFN [SF] were evaluated in another large sample of active duty Air Force nurses. Structural equation modeling was used to test the psychometric properties of the READI-R-AFN and the READI-R-AFN [SF]. Characteristics of the sample and results of the pilot study and the evaluation of the READI-R-AFN [SF] are presented below.

### Results of Phase I - Pilot Study

#### Characteristics of the Sample

Questionnaires were hand-administered by a liaison nurse researcher to 350 active duty Air Force nurses who agreed to participate in the pilot study. All participants were assigned to a large Air Force Medical Center located at Lackland Air Force Base, Texas. One hundred eighty one questionnaires (52%) were returned. Demographic data and

descriptive statistics of the sample are identified in Table 5. The mean age was  $37.2 \pm 8.6$  years. The majority was female (71%), with a mean of  $10.4 \pm 6.9$  years of nursing experience. Thirty one percent had prior deployment experience and 51% were on mobility status.

Table 5

Sociodemographics of Pilot Study Sample

Characteristic	Mean	Std. Dev.
N = 181		
Years nursing experience	10.44	$\pm 6.92$
Age	37.21	$\pm 8.61$
	<u>Frequency</u>	<u>Percent</u>
Missing	2	1
Gender		
Male	52	29
Female	127	71
Prior Deployment		
Yes	55	31
No	124	69
On Mobility		
Yes	91	51
No	88	49

Specific Aims

The pilot study results met the specific aims of the pilot study to:

1. Test the reliability and validity of the revised READI (Reineck, 1998) in a sample of active duty Air Force nurses to develop the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN).

2. Devise a brief form of the READI-R-AFN, the READI-R-AFN Short Form [SF] as indicated in pilot study results.

### Research Questions

1. What is the estimated reliability of the READI-R-AFN expressed in terms of (a) internal consistency, (b) test-retest reliability, and (c) multiple correlation coefficient ( $R^2$ )?
2. What is the estimated validity of the READI-R-AFN AFN expressed in terms of (a) confirmatory factor analysis, and (b) convergent-discriminant validity?

### Evaluation of Reliability

The first research question addressed evaluation of reliability of the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN). Three methods were employed to address reliability of the READI-R-AFN. Each method is described as follows.

### Internal Consistency

Internal consistency or the relatedness of the items within each factor was evaluated using Cronbach's alpha (Nunnally & Bernstein, 1994). Results are displayed in Table 12. Mean item correlations for each subscale ranged from 0.31 for the Personal/Psychosocial/ Physical Readiness Subscale to 0.79 for the Group Integration and Identification Subscale. As shown in Appendix 6, all subscale scores have  $R^2 > 0.50$ , except the Personal/Psychosocial/Physical Readiness Subscale, giving evidence of internal consistency. The Personal/Psychosocial/Physical Readiness Subscale includes a variety of items that could possibly be representative of more than one concept and may indicate the need to break the subscale into more dimensions. This may explain the

reason for the low estimates on the alpha coefficients for internal consistency of the measure. The item means, SD and bivariate correlations for all READI-R-AFN subscales are summarized in Appendix 8.

### Structural Equation Modeling (SEM)

A squared multiple correlation coefficient ( $R^2$ ) for each item was estimated as a measure of reliability. The six models tested were: (a) Clinical Competency, (b) Operational Competency, (c) Soldier Survival Skills, (d) Personal/Psychosocial/Physical Readiness, (e) Satisfaction with Leadership and Administrative Support, and (f) Group Integration and Identification.

#### Clinical Competency Measurement Model

The Clinical Competency measurement model included 28 items related to clinical nursing skills. The first 28 items on the READI-R-AFN questionnaire shown in Appendix 2 make up the items hypothesized to measure the dimension of Clinical Competency. All indicators,  $R^2$  values and critical ratios for each indicator are summarized in Table 6.



Table 6.

Clinical Competency Measurement Model

Indicators	critical ratio	R <sup>2</sup>
Clin1-Competent treating shock	9.11	.54
Clin2-Competent as a nurse in a mass casualty	9.29	.57
Clin3-Documentation of a patient's condition on a field medical card	8.06	.41
Clin4-Current field technology for clinical documentation	6.34	.25
Clin5-Calculating an IV drip without a calculator	6.94	.30
Clin6-Reconstituting medications, calculating dosages 7 administering IV medications	7.68	.37
Clin7-Ability to assess patients without the presence of a Physician	9.15	.55
Clin8-Performance in emergency situations, such as in cardiac Arrest	9.32	.57
Clin9-Using the concept of body surface area to calculate extent of patient's burns	8.27	.44
Clin10-Principles involved in deciding which critically injured patient is seen first	9.99	.67
Clin11-Performing ACLS without a doctor present	8.58	.47
Clin12-Taking care of life threatening injuries	10.25	.71
Clin13-Providing nursing care to a multiple trauma patient	9.68	.63
Clin14-Caring for a patient with NBC injuries	8.72	.49
Clin15-Caring for patients with ballistic missile injuries	9.42	.59
Clin16-Recognition of a patient with a tension pneumothorax	10.25	.72
Clin17-Performing fluid resuscitation of a burn patient	9.73	.63
Clin18-Performing resuscitation with blood products	9.07	.54
Clin19-In the use of the field ventilator (Impact 754)	6.57	.27
Clin20-Performing airway management	9.15	.55
Clin21-Implementing the triage categories	9.82	.65
Clin22-Performing in a multi-disciplinary healthcare team	8.28	.44
Clin23-Providing care to a non-English speaking patient	5.11	.16
Clin24-Performing Mental Health nursing skills (care of a patient with PTSD)	4.45	.19
Clin25-In using field infection control	7.99	.41
Clin26-Using Orthopedic nursing skills (care of a patient in traction)	7.88	.39
Clin27-Using Neurologic nursing skills (care of a patient with head trauma)	7.88	.40
Clin28-Performing a complete nursing assessment and interpreting findings	7.96	.44

### Operational Competency Measurement Model

The Operational Competency measurement model included 9 items related to field nursing skills. Items 29 to 37 on the READI-R-AFN questionnaire shown in Appendix 2 make up the items hypothesized to measure the dimension of Operational Competency. All indicators,  $R^2$  values and critical ratios for each indicator are shown in Table 7.

Table 7

### Operational Competency Measurement Model

Indicators	critical ratio	$R^2$
Op29-Performing EKG with suction cup electrodes	6.71	.24
Op30-Operating portable suction apparatus	8.37	.35
Op31-Following Aero medical evacuation procedures	11.87	.62
Op32-Understanding capacity of each Echelon/Level of Care	13.47	.74
Op33-Knowing Law of Armed Conflict violations	13.57	.75
Op34-Setting up Field Sanitation and Hygiene	11.51	.59
Op35-Setting up Deployable Medical Systems (DEPMEDS)	11.51	.52
Op36-Dealing with the unexpected (providing patient care in a bomb shelter)	10.58	.70
Op37-Caring for patients injured by weapons of mass destruction (terrorist attacks)	12.96	.64

### Soldier Survival Skills Measurement Model

The Soldier Survival Skills measurement model included 10 items related to military survival skills required of all Air Force personnel. Items 38 to 47 on the READI-R-AFN questionnaire shown in Appendix 2 make up the items hypothesized to measure

the dimension of Soldier Survival Skills. All indicators,  $R^2$  values and critical ratios for each indicator are summarized in Table 8.

Table 8

Soldier Survival Skills Measurement Model

Indicators	critical ratio	$R^2$
sss38-Supporting humanitarian assistance	11.72	.56
sss39-Requirements to protect yourself and patients if called to do so	13.12	.65
sss40-Ability to perform nursing skills in the M40 mask and MOPP gear	12.75	.62
sss41-Decontamination procedures of a patient exposed to chemical or biologic agents	12.75	.67
sss42-Application of Laws of Armed Conflict in a deployed setting	14.97	.76
sss43-Ability to perform medical specialty under adverse field conditions	12.25	.69
sss44-Ability to decontaminate yourself using standard decontamination equipment	14.78	.75
sss45-With status under the Geneva Convention	13.40	.67
sss46-With the use of field communications equipment	13.40	.54
sss47-Actions to take during warning alarms	11.39	.70

Personal/Psychosocial/Physical Readiness Measurement Model

The Personal/Psychosocial/Physical Readiness measurement model included 24 items related to Air Force preparation for deployment required of all personnel. Items 48 to 71 on the READI-R-AFN questionnaire shown in Appendix 2 make up the items

hypothesized to measure the dimension of Personal/Psychosocial/Physical Readiness.

All indicators,  $R^2$  values and critical ratios for each indicator are summarized in Table 9.

Table 9

Personal/Psychosocial/Physical Readiness Measurement Model

Indicators	critical ratio	$R^2$
ppp48-Maintaining dental fitness by annual dental exams	6.04	.25
ppp49-An ideal physical state with annual health exams is important to prevent disease	5.14	.17
ppp50-Participating in 30 minutes of aerobic exercise at least 3 times/week helps prevent illness	6.27	.27
ppp51-It is important to keep family care plans up to date to avoid delays in deployment processing	7.03	.36
ppp52-It is important to complete all mobility requirements to maintain an ideal state of preparedness	6.98	.35
ppp53-Confident support system (family/friends) will meet all my psychosocial needs	8.04	.50*
ppp54-Confident support system will maintain communication	7.82	.46*
ppp55-Confident support system will be cared for in my absence	6.80	.33
ppp56-Important to have my 'Will' in order prior to deployment	7.34	.35
ppp57-Important to have legal power of attorney arranged to prepare	7.34	.40
ppp58-Important to have legal matters attended to before deployment	7.31	.41*
ppp59-Mission success is enhanced by a good working relationship with my co-workers	7.44	.39
ppp60-Prior deployment experience and/or deployment processing prepared me for future deployments	4.16	.11
ppp61-Confident in my ability to manage stress related to my job	4.16	.43
ppp62-Confident in my ability to manage stress related to my family	7.82	.47
ppp63-Confident in my ability to manage stress related to my finances	7.93	.48
ppp64-Confident I will be able to access emotional support if deployed	7.15	.37
ppp65-Confident I will know how to access mental health services	7.45	.41
ppp66-Prepared to deal with death, dying and carnage	6.65	.31
ppp67-Exploring possibility of own death will make me more able to function in a deployed setting	5.54	.21
ppp68-Prepared to deal with battle stress	5.54	.32
ppp69-Prepared to deal with weather extremes	6.40	.29
ppp70-Understand work schedules involve long hours deployed setting	6.40	.33
ppp71-Lack of privacy will be a fact of life while deployed	6.84	.39

Satisfaction with Leadership and Administrative Support Measurement Model

The Satisfaction with Leadership and Administrative Support measurement model

included 6 items related to satisfaction with leadership and administrative support

provided to Air Force personnel who are deployed. Items 72 to 77 on the READI-R-AFN questionnaire shown in Appendix 2 make up the items hypothesized to measure the dimension of Satisfaction With Leadership and Administrative Support. All indicators,  $R^2$  values and critical ratios for each indicator are summarized in Table 10.

Table 10

Satisfaction With Leadership and Administrative Support Measurement Model

Indicators	critical ratio	$R^2$
1a72-Have responsibility to know and use Chain of Command when deployed	6.97	.30
1a73-Understand military rules and regulations	6.95	.30
1a74-Believe there is a need for military rules and regulations on deployment	8.26	.43
1a75-Deployment commander should practice principle "Know your people and look out for their well-being"	10.96	.74
1a76-Important deployment commander be sure training on deployment is realistic, relevant, with high standards	10.69	.80
1a77-Deployment commander must keep me informed of pertinent information	10.97	.50

Group Integration and Identification Measurement Model

The Group Integration and Identification measurement model included 6 items related to ability to work and interact in close quarters with others in the deployed setting. Items 77 to 83 on the READI-R-AFN questionnaire shown in Appendix 2 make up the items hypothesized to measure the dimension of Group Integration and Identification.

All indicators,  $R^2$  values and critical ratios for each indicator are summarized in Table 11.

Table 11

Group Integration and Identification Measurement Model

Indicators	critical ratio	$R^2$
gii78-Prepared to deal with crowded and co-ed sleeping quarters while deployed	2.56	.15
gii79-Satisfied I will be given sufficient deployment training prior to deployment	2.88	.89
gii80-Will be given sufficient training on pertinent equipment prior to deployment	2.88	.94
gii81-Understanding deployed unit's mission, vision & values is critical to performance	2.65	.21
gii82-Confident I will be able to function as a group leader in a deployed setting	2.59	.17
gii83-It is critical to have a good working relationship with members in my deployment unit	2.60	.05

Assessment of Validity

Content and convergent and discriminant validity were assessed as part of the validation process of the READI-R-AFN. Content validity was discussed at length in Chapter 3. Convergent and discriminant validity were evaluated through the correlation of scores on the READI-R-AFN with scores on the Derogatis Affects Balance Scale (DABS) (Derogatis, 1996) and Brief Symptom Inventory-18 (BSI-18) (Derogatis, 2000).

The summary of statistics for each measurement model of the READI-R-AFN using AMOS version 4.0 (Arbuckle & Wothke, 1999) is presented in Table 12. Results

indicated that none of the models for any of the subscales fit the data well, supporting the need to modify the READI-R-AFN to improve the fit of the model. The chi square result was significant for each model, and in all cases  $\chi^2/df$  was greater than the desired 3.0 (Bollen, 1989). Table 12 summarizes overall fit statistics for each model. Appendix 6 summarizes the items retained to create the READI-R-AFN Short Form [SF], including factor loadings of each item.

Table 12  
Item Correlation and Goodness of Fit Statistics

N=181	Mean Item r	$\chi^2$	$\chi^2/df$	NFI	CFI	RMSEA
Clinical Competency	.45	1063.16	3.04	.93	.95	.11
Operational Competency	.55	99.97	3.70	.98	.98	.12
Soldier Survival Skills	.64	143.10	4.09	.97	.98	.13
Personal/Psychosocial/ Physical Readiness	.31	1791.90	7.11	.90	.91	.18
Leadership & Administrative Support	.50	109.83	12.20	.98	.98	.25
Group Integration & Identification	.79	95.91	10.66	.97	.98	.23
READI-R-AFN	.29	198.76	22.08	.95	.96	.34

### Research Hypothesis

Individuals with positive emotional bounds on the Derogatis Affects Balance Scale (DABS) (Derogatis, 1975; 1996a) and absence of dysphoric emotional conflict and psychological distress on the Brief Symptom Inventory-18 (BSI-18) (Derogatis, 1993, 2000) will demonstrate higher readiness scores on the READI-R-AFN.

Bivariate correlations of scores on the READI-R-AFN with scores on the DABS (Derogatis, 1975; 1996a) and scores on the BSI-18 (Derogatis, 2000) were in the

expected direction. The greatest significance was found with scores on the anxiety subscale of the BSI-18 and with scores on the negative affects subscale of the DABS when correlated with scores on all subscales of the READI-R-AFN. Significant positive correlations were found between the vigor subscale of the DABS and the Personal/Psychosocial/Physical and Group Integration and Identification subscales of the READI-R-AFN.

The remaining measures were found to reveal correlations in the expected direction of the hypothesis, but did not reach significance. The negative affective scores of the DABS and all scores on the anxiety, somaticism, and depression subscales of the BSI-18 are much more significant than the positive affective measures when correlated with scores on the READI-R-AFN. For example, low score on the negative subscales of the DABS and BSI-18 indicate absence of symptoms and negative affect.

The higher scores on the READI-R-AFN indicate greater levels of preparedness. The negative correlation indicates those who are more likely to be without symptoms are more likely to indicate higher levels of preparedness. This is an indication that absence of negative affectivity is a greater predictor of levels of readiness as indicated by the READI-R-AFN than positive affectivity.

In correlations of both the DABS and the BSI-18, the subscales related to anxiety had the most significant correlations with scores on the READI-R-AFN, with scores on the Personal/Psychosocial/Physical Readiness, Leadership and Administrative Support, and Group Integration and Identification subscales. Table 13 shows item means, standard deviations, and bivariate correlations (Pearson  $r$ ) from the complete data for the READI-



R-AFN subscales and total scale, the BSI subscales and total scale, and the DABS subscales and total scale.

Table 13

Item Means, Standard Deviations, and Bivariate Correlations for the READI-R-AFN Subscales/Total scale, BSI-18 Subscales/Total scale, and DABS Subscales/Total Scale

N=181	M	SD	Correlation						Total Scale
			CLIN	OP	SSS	PPP	LA	GII	
CLIN	95.29	31.19	1.00						
OP	28.20	8.40	.82*	1.00					
SSS	32.14	9.49	.72*	.85*	1.00				
PPP	103.82	12.06	.40*	.37*	.46*	1.00			
LA	28.03	2.86	.35*	.31*	.39*	.59*	1.00		
GII	23.86	4.01	.34*	.28*	.36*	.62*	.52*	1.00	
Total Scale	311.46	46.45	.90**	.86**	.85**	.67**	.54**	.57**	1.00
GSI	46.51	9.25	-.31**	-.20*	-.17*	-.27**	-.15*	-.29**	-.32**
Depression	47.49	8.23	-.24**	-.16**	-.13	-.21*	-.15*	-.20*	-.24**
Anxiety	47.79	8.28	-.28**	-.16*	-.16*	-.26**	-.20*	-.28**	-.29**
Somatization	46.92	7.55	-.27**	-.18**	-.16*	-.18*	-.05	-.22*	-.26**
PTOT	55.24	9.70	.14	.09	.11	.25**	.07	.21*	.20*
Joy	13.88	2.53	.07	.02	.05	.24**	.04	.15*	.13*
Content	13.80	2.53	.11	.05	.07	.23**	.07	.18*	.16*
Vigor	13.43	2.73	.18*	.13*	.18*	.28**	.09	.25**	.24**
Affect	14.18	2.90	.15*	.11	.09	.18*	.09	.16*	.17*
NTOT	22.10	10.27	-.25**	-.19*	-.21*	-.24**	-.13	-.19*	-.27**
Anxious	7.24	2.84	-.32**	-.25**	-.25**	-.23**	-.11	-.21*	-.33**
Depressed	4.61	2.96	-.23**	-.19*	-.20*	-.21*	-.11	-.15*	-.26**
Guilt	4.52	3.15	-.16*	-.11	-.13*	-.14*	-.09	-.08	-.17*
Hostile	5.60	2.63	-.18*	-.15*	-.20*	-.27**	-.16*	-.23**	-.25**
ABI	1.69	.80	.21*	.14	.18*	.29**	.13	.23*	.26**
PAR	.77	.59	.13	.09	.10	.05	.05	.09	.12
AEI	77.33	9.89	-.12	-.11	-.19	-.01	-.07	.01	-.09

CLIN = Clinical Competency; OP = Operational Competency; SSS = Soldier Survival Skills; PPP = Personal/Psychosocial/Physical Preparation; LA = Leadership & Administrative Support; GII = Group Integration & Identification; GSI = Global Severity Index; PTOT = Positive Affects Total; NTOT = Negative Affects Total; ABI = Affects Balance Index; PAR = Positive Affects Ratio; AEI = Affects Expressiveness Index; \*\*Significant at  $p < .001$ ; \*Significant at  $p < .05$ .

### Item Analysis

Preliminary item-analysis was done to evaluate individual items for a symmetrical distribution of scores. Items retained from the Clinical Competency, and the Operational Competency subscales were those with the largest variance. Items retained from the

Soldier Survival Skills, Personal/Psychosocial/Physical, Leadership and Administrative Support and Group Integration and Identification Subscales were retained primarily due to the lambda values and reliability ( $R^2$ ) results. Results of the item analyses distribution are shown in Appendix 6.

### Summary of Pilot Study

The original six dimensions of Individual Medical Readiness (IMR); (a) Clinical Competency, (b) Operational Competency, (c) Soldier Survival Skills, (d) Personal/Psychosocial/Physical Readiness, (e) Leadership and Administrative Support, and (f) Group Integration and Identification were confirmed as significant dimensions of Individual Medical Readiness in this sample of active duty AF nurses. In addition, evaluation of reliability and validity estimates supported reduction of items in each subscale so the original 83-item READI-R-AFN was revised to a 40-item READI-R-AFN Short Form [SF] version. The READI-R-AFN [SF] was distributed to another sample of active duty AF nurses to evaluate reliability and validity.

### Results of Phase II - Full Field Test

Specific aims of the full field test were to evaluate the reliability and validity of Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form (READI-R-AFN[SF]) in a large sample of active duty Air Force nurses as described above.

### Characteristics of the Sample

The READI-R-AFN [SF] was distributed to 500 active duty Air Force nurses assigned at three different large Air Force Medical Centers located throughout the Continental United States. Two hundred five (41%) questionnaires were returned.

Demographic data and descriptive statistics of the sample are identified in Table 14. The mean age was  $36.31 \pm 9.3$  years. The majority was female (70%), with a mean of  $11.52 \pm 7.17$  years of nursing experience. Thirty six percent had prior deployment experience. Demographic data resemble results found in the pilot study with the exception of nurses on mobility. Most of the nurses in the full field study (82%) were on mobility (ready to deploy) status.

Table 14

Sociodemographics of Full Field Test Sample

Characteristic	Mean	Std. Dev.
N = 205		
Years nursing experience	11.52	+7.17
Age	36.31	+9.30
Gender	<u>Frequency</u>	<u>Percent</u>
Male	62	30
Female	143	70
Prior Deployment		
No Answer Provided	6	3
Yes	73	36
No	126	62
On Mobility		
Missing	2	1
Yes	169	82
No	34	16

Assumptions of Structural Equation Modeling (SEM)

SPSS for Windows 10.0 and AMOS 4.0 (Arbuckle & Wothke, 1999) were again used to analyze data. The unit of analysis was the participant answering each questionnaire. Examination of frequency distributions, following the recommendations of Tabachnick and Fidell (1996) revealed a low frequency of missing data. Eleven participants, which was five percent of the total sample, had missing data. Data were missing completely at random and were addressed in subsequent SEM analyses through the use of full-information maximum likelihood estimation available in AMOS. Missing

the use of full-information maximum likelihood estimation available in AMOS. Missing data were replaced for each subscale with the person mean substitution (PMS). The PMS is the most frequently used method with Likert scales, and replaces the individual's missing item by the mean of available items in that scale (Zhou, 2001). Based upon a comparison of imputation methods (Zhou, 2001), for minimal missing items (<10%), there was little difference in outcomes of imputation methods, and PMS was recommended as an acceptable method. In addition, 6 respondents (3% of the sample) failed to complete a BSI or DABS and were not included for convergent validation of the READI-R-AFN Short Form [SF]. Therefore, raw data were screened and data assumptions addressed using the examine diagnostics in SPSS 10.0 to assess if the data met the assumptions of SEM.

#### Multivariate Normality of Distribution and Linearity

Multivariate normality was the first assumption addressed and is essential if conducting the maximum likelihood estimation (MLE) procedure used most often with SEM analyses (Bollen, 1989; Joreskog & Sorbom, 1993; Pedhazur & Schmelkin, 1991; Stevens, 1996). Since sum scores are used in the Likert scales of each questionnaire, the items are treated as continuous variables in the data set. This summative scale format allows more precise information about the individual's position on the dimension as referenced by any given item (Mishel, 1989). Each subscale and total scale of the READI-R-AFN [SF] was explored for the normality assumption and revealed that the degree of skewness and kurtosis of each subscales distribution was within acceptable ranges, so the multivariate normality assumption was met.

### Interval Level of Measurement

A second assumption required for SEM is that of interval level measurement for variables used in analyses. Most of the variables in this study were ordinal in nature (Likert scale format), which do not include absolute value or equal distance between levels. However, sum scores on the subscales provide a numerical anchor that allows treatment of these scales as interval level data (Mishel, 1989).

### Multicollinearity

Finally, the variables were evaluated for the presence of multicollinearity, which is problematic when performing factor analysis and SEM. Examination of correlation matrices for all indicator variables displayed no correlations greater than  $r = 0.85$ , indicating an absence of multicollinearity (Stevens, 1996).

Following examination of data for any violation of underlying statistical assumptions of analyses, preliminary correlational analyses were conducted. Pearson correlation coefficients were used to examine bivariate relationships of summed subscale scores, treated as interval data, and Spearman rho was used to examine categorical data (Stevens, 1996).

All data assumptions were addressed and were met, so preliminary correlational analyses were conducted. Bivariate relationships were examined using Pearson correlations for interval level variables and Spearman rho for categorical data. Decisions were then made on which variables were to be removed or the parameters to be added in subsequent analyses.

### Preliminary Item Analysis

Preliminary item-analysis was done to evaluate individual items for a symmetrical distribution of scores. See Appendix 10 for item frequencies and percent response of READI-R-AFN [SF] scales for subjects with complete data (n=205). The distribution of scores was improved over that found in the pilot study, showing more of an indication that the revised scale items were more likely to discriminate. The items on the Personal/Psychosocial/Physical subscale continue to have a greater overall item mean, indicating respondents are more likely to totally agree with items as specified on the subscale as shown in Appendix 10.

### Research Questions

Research questions addressed in these analyses are as follows:

1. What is the estimated reliability of the READI-R-AFN [SF] expressed in terms of (a) internal consistency, and (b) multiple correlation coefficient ( $R^2$ )?
2. What is the estimated validity of the READI-R-AFN AFN [SF] expressed in terms of (a) confirmatory factor analysis, and (b) convergent-discriminant validity?

### Reliability

Two forms of reliability estimates were performed as a result of the low rate of return in the pilot study (N=7) for the test-retest procedure. Since the study included three separate questionnaires as part of the validation process, the participants were already burdened with a lengthy process to complete the study. It is not surprising participants were unwilling to complete the READI-R-AFN a second time.

Preliminary internal consistency was estimated using Cronbach's alpha. SEM was used to obtain a squared multiple correlation coefficient ( $R^2$ ), which estimates the

amount of variance explained by each item (Bollen, 1989). Cronbach's alpha and the multiple correlation coefficient ( $R^2$ ) for each subscale of the READI-R-AFN [SF] results are displayed in Table 15.

Table 15

Internal Consistency for the READI-R-AFN [SF]

<u>Subscale</u>	<u>Coefficient <math>\alpha</math></u>	<u><math>R^2</math></u>
Total Sample =	N=205	N=205
Clinical Competency	0.94	0.46
Operational Competency	0.87	0.84
Soldier/Survival Skills	0.90	0.82
Personal/ Psychosocial/ Physical Readiness	0.82	0.51
Leadership & Administrative Support	0.70	0.33
Group Integration & Identification	0.57	0.50

Internal Consistency

As noted, internal consistency (relatedness) of the items within each factor was evaluated using Cronbach's alpha (Nunnally & Bernstein, 1994). Item statistics for each scale are shown in Appendix 11. The Clinical Competency subscale which included 10 items had a range of 2.54 to 3.98; the Operational Competency subscale which included 7 items ranged from 2.79 to 3.33; the Soldier Survival Skills subscale included 8 items and scores ranged from 2.76 to 3.89; the Personal/ Psychosocial/ Physical Readiness subscale included 7 items with scores that ranged from 4.09 to 4.46; the Leadership and



Administrative Support subscale included 4 items with scores that ranged from 2.69 to 3.16; and the Group Integration and Identification subscale included 4 items with scores that ranged from 3.98 to 4.46.

Bivariate correlations with each subscale of the READI-R-AFN [SF] are also displayed in Appendix 11, which includes the correlation matrix of each subscale with the total scale. Bivariate correlations for items of each subscale with the total subscale score include; (a) Clinical Competency subscale range from  $r = 0.73$  to  $0.87$ ; (b) Operational Competency subscale range from  $r = 0.69$  to  $0.77$ ; (c) Soldier Survival Skills subscale range from  $r = 0.72$  to  $0.81$ ; (d) Personal/ Psychosocial/Physical Readiness subscale ranged from  $r = 0.52$  to  $0.79$ ; (e) Leadership and Administrative Support subscale ranged from  $r = 0.67$  to  $0.80$ ; and finally (f) Group Integration and Identification subscale ranged from  $r = 0.48$  to  $0.76$ .

Bivariate correlations of scores from each subscale with the total READI-R-AFN [SF] ranged from  $r = 0.52$  to  $0.89$ . The majority of bivariate correlations were significant at the  $p < .001$  level. Cronbach alpha results revealed all alpha levels  $\geq 0.70$  except the Group Integration and Identification subscale scores. All remaining subscales showed evidence of internal consistency (Nunnally & Bernstein, 1994). Coefficient alpha and multiple correlation coefficients ( $R^2$ ) for each subscale are presented in Table 15.

### Validity

Validity was also addressed through the use of structural equation modeling (SEM) and hypothesis testing. Results are discussed separately for each in the following pages.

### Confirmatory Factor Analysis

SEM using AMOS 4.0 (Arbuckle & Wothke, 1999) with Maximum Likelihood estimation was used to conduct a confirmatory factor analysis (CFA) to evaluate construct validity of the Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form (READI-R-AFN [SF]). Results reported as standardized factor loadings, standard errors, and critical ratios for each item of the measure are shown in Appendix 12.

The chi-square, and chi square adjusted for degrees of freedom is significant for every subscale, except the Leadership and Administrative Support subscale. The significant chi square statistic is an indication the model does not fit the data. Several fit indices are recommended when evaluating whether a measurement model fits the data (Bollen & Long, 1993; Joreskog, 1993; Kline, 1998; Stevens, 1996). CFA results are presented for each subscale measurement model in Table 16.

Table 16

Item Correlation and Goodness of Fit Statistics for the READI-R-AFN [SF]

N=205	Mean Item r	$\chi^2$	$\chi^2/df$	CFI	NFI	RMSEA
Clinical Competency	.59	192.00*	5.49**	.98	.97	.15
Operational Competency	.48	104.41*	7.46**	.98	.97	.18
Soldier Survival Skills	.53	68.02**	3.40**	.99	.99	.11
Personal/Psychosocial/ Physical Readiness	.36	62.27**	4.45**	.99	.99	.13
Leadership & Administrative Support	.37	2.90 (NS)	1.45	.99	.99	.05
Group Integration & Identification	.25	18.44**	9.22**	.99	.99	.20

An inspection of the critical ratio for each factor loading revealed all items were statistically significant. The loadings also appear reasonable with a magnitude that is expected and in the expected direction. Overall, the fit of the READI-R-AFN [SF] subscales were adequate. The Leadership and Administrative Support subscale is the only subscale measurement model that fits the data based on chi-square (desire nonsignificant) and chi square/degrees of freedom (desire  $< 3.0$ ) (Kline, 1998). In addition, the CFI and NFI for each model range from 0.97 to 0.99. Values greater than 0.90 are desired as indicators of a good model fit (Bollen, 1989; Kline, 1998; Stevens, 1996). Goodness of fit statistics for each subscale of the READI-R-AFN [SF] are presented in Table 17 through Table 22. Factor loadings for the Clinical Competency subscale range from alpha 0.40 to 0.85. Factor loadings for the Operational Competency subscale range from alpha 0.50 to 0.86. Factor loadings from the Soldier Survival Skills

subscale range from alpha 0.73 to 0.87. Factor loadings for the Personal/Psychosocial/Physical Readiness subscale ranged from alpha 0.33 to 0.71. Factor loadings from the Leadership and Administrative Support subscale ranged from alpha 0.55 to 0.89. And finally, factor loadings from the Group Integration and Identification subscale ranged from alpha of 0.22 to 0.97.

#### Clinical Competency Measurement Model

The revised Clinical Competency measurement model included 10 items related to clinical nursing skills. All indicators,  $R^2$  values and critical ratio for each indicator are summarized in Table 17.

Table 17

#### Clinical Competency Measurement Model

Indicators	critical ratio	$R^2$
Clin2-Competent as a nurse in a mass casualty	9.95	.57
Clin8-Performance in emergency situations, such as in cardiac arrest	10.84	.57
Clin12-Taking care of life threatening injuries	12.25	.71
Clin13-Providing nursing care to a multiple trauma patient	12.27	.63
Clin15-Caring for patients with ballistic missile injuries	10.96	.59
Clin16-Recognition of a patient with a tension pneumothorax	11.58	.72
Clin17-Performing fluid resuscitation of a burn patient	10.83	.63
Clin18-Performing resuscitation with blood products	9.59	.54
Clin20-Performing airway management	10.22	.55
Clin21-Implementing the triage categories	10.22	.65

### Operational Competency Measurement Model

The Operational Competency measurement model included 7 items related to field nursing skills. All indicators,  $R^2$  values and critical ratio for each indicator are shown in Table 18.

Table 18

### Operational Competency Measurement Model

Indicators	critical ratio	$R^2$
Op31-Following Aero medical evacuation procedures	7.75	.62
Op32-Understanding capacity of each Echelon/Level of Care	8.71	.74
Op33-Knowing Law of Armed Conflict violations	8.48	.75
Op34-Setting up Field Sanitation and Hygiene	7.52	.59
Op35-Setting up Deployable Medical Systems (DEPMEDS)	7.50	.52
Op36-Dealing with the unexpected (providing patient care in a bomb shelter)	8.15	.70
Op37-Caring for patients injured by weapons of mass destruction (terrorist attacks)	8.15	.64

### Soldier Survival Skills measurement model

The Soldier Survival Skills measurement model included 10 items related to military survival skills required of all Air Force personnel. All indicators,  $R^2$  values and critical ratio for each indicator are summarized in Table 19.

Table 19

Soldier Survival Skills Measurement Model

Indicators	critical ratio	R <sup>2</sup>
sss39-Requirements to protect yourself and patients if called to do so	9.94	.65
sss40-Ability to perform nursing skills in the M40 mask and MOPP gear	9.88	.62
sss41-Decontamination procedures of a patient exposed to chemical or biologic agents	11.13	.67
sss43-Ability to perform medical specialty under adverse field conditions	9.84	.69
sss44-Ability to decontaminate yourself using standard decontamination equipment	11.37	.75
sss45-With status under the Geneva Convention	9.80	.67
sss46-With the use of field communications equipment	9.32	.54
sss47-Actions to take during warning alarms	9.31	.70

Personal/Psychosocial/Physical Readiness Measurement Model

The Personal/Psychosocial/Physical Readiness measurement model included 7 items related to Air Force preparation for deployment required of all personnel. All indicators, R<sup>2</sup> values and critical ratio for each indicator are summarized in Table 20.

Table 20

Personal/Psychosocial/Physical Readiness Measurement Model

Indicators	critical ratio	R <sup>2</sup>
ppp53-Confident support system (family/friends) will meet all my psychosocial needs	2.58	.50
ppp54-Confident support system will maintain communication with me	2.74	.46
ppp61-Confident in my ability to manage stress related to my primary job	2.83	.43
ppp62-Confident in my ability to manage stress related to my family	2.85	.47
ppp63-Confident in my ability to manage stress related to my finances	2.83	.48
ppp64-Confident I will be able to access emotional support while deployed	2.76	.37
ppp65-Confident I will know how to access mental health services if needed	2.77	.41

Leadership and Administrative Support Measurement Model

The Satisfaction with Leadership and Administrative Support measurement model included 4 items related to satisfaction with leadership and administrative support provided Air Force personnel are deployed. All indicators, R<sup>2</sup> values and critical ratio for each indicator are summarized in Table 21.

Table 21

Leadership and Administrative Support Measurement Model

Indicators	critical ratio	R <sup>2</sup>
la74-Believe there is a need for military rules and regulations on deployment	5.69	.43
la75-Deployment commander should practice principle "Know your people and look out for their well-being"	6.56	.74
la76-Important deployment commander be sure training on deployment is realistic, relevant, with high standards	5.79	.80
la77-Deployment commander must keep me informed of pertinent information	5.79	.50

Group Integration and Identification Measurement Model

The Group Integration and Identification measurement model included 4 items related to ability to work and interact in close quarters with others in the deployed setting.

All indicators, R<sup>2</sup> values and critical ratio for each indicator are summarized in Table 22.

Table 22

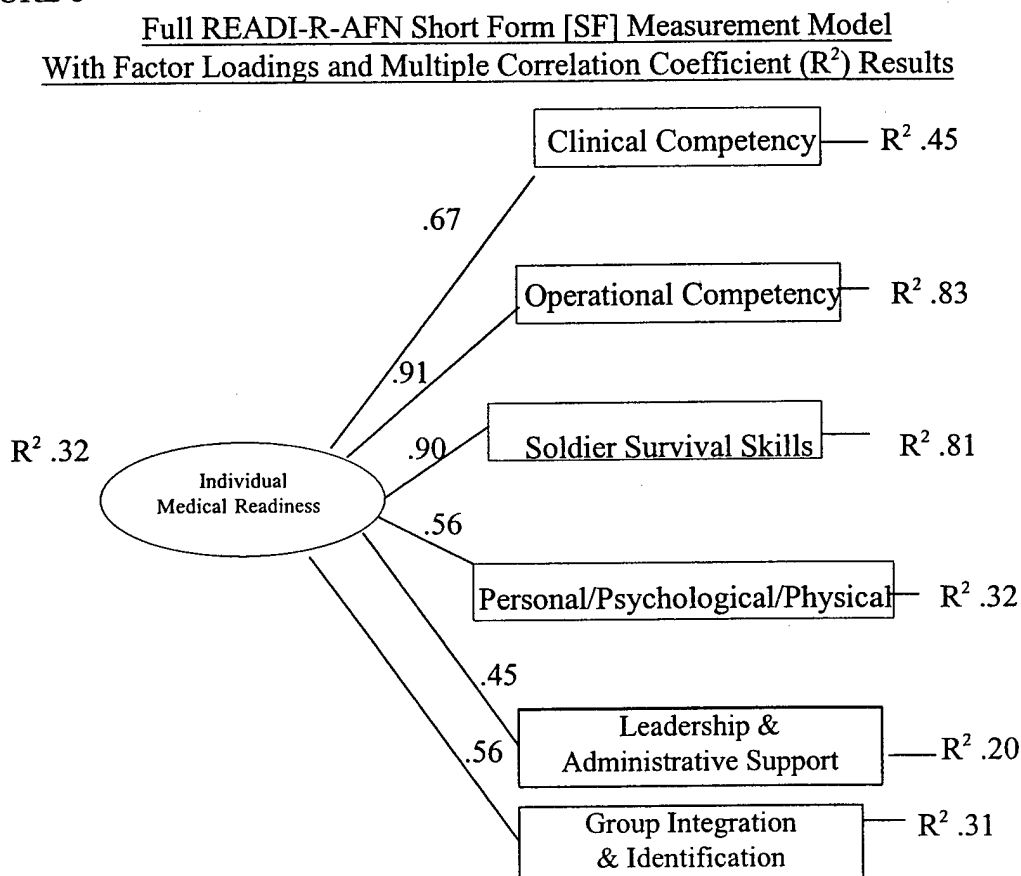
Group Integration and Identification Measurement Model

Indicators	critical ratio	R <sup>2</sup>
gii78-Prepared to deal with crowded and co-ed sleeping quarters while deployed	2.93	.15
gii81-Understanding deployed unit's mission, vision & values is critical to performance	2.98	.21
gii82-Confident I will be able to function as a group leader in a deployed setting	2.79	.17
gii83-It is critical to have a good working relationship with members in my deployment unit	2.79	.05



The measurement model for each subscale provided evidence of reliability and validity so the READI-R-AFN [SF] full-scale measurement model was tested. The READI-R-AFN [SF] full-scale measurement model with standardized maximum likelihood parameter estimates for the hypothesized model is shown in Figure 8.

FIGURE 8



Readiness Estimate and Deployability Index

Revised for Air Force Nurses Short Form (READI-R-AFN [SF])

The hypothesized measurement model of the READI-R-AFN [SF] indicated adequate fit, and all indicators loaded significantly on the latent variable ( $c.r. > 2$ ). Although the fit was adequate, the goodness of fit statistics were less than desirable

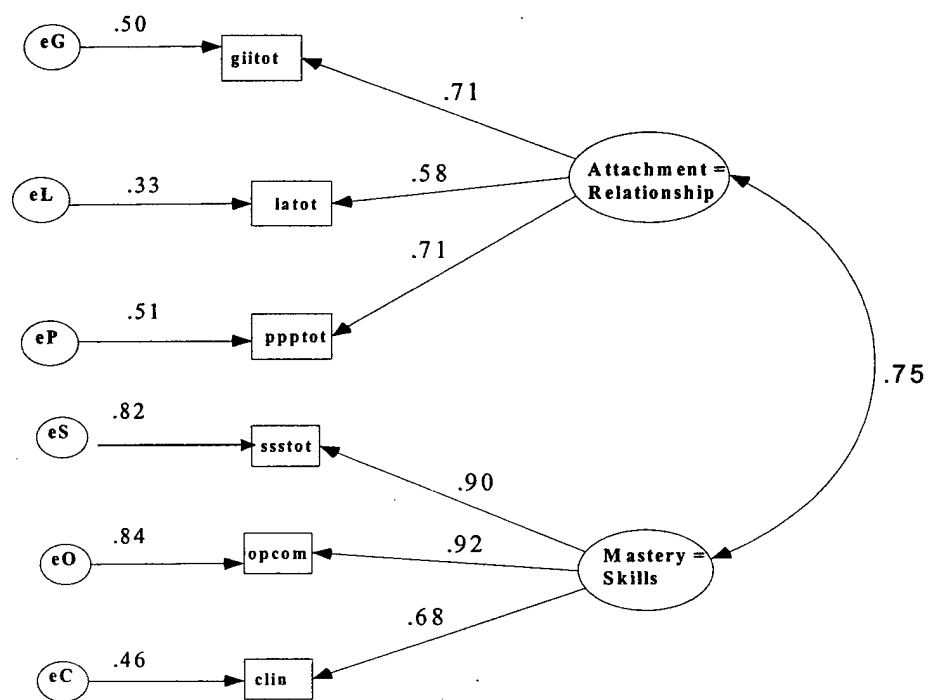
(significant chi square,  $\chi^2 > 3$ , and RMSEA  $>.10$ ) (Kline, 1998), so a model generating approach was employed (Joreskog, 1993). A model generating approach is taken when a tentative initial model does not fit the data. The modification indices specified when the initial model is tested are used to modify the model. The model is then tested again with the same data.

There were significant high correlations of the scores from the Clinical Competency, Operational Competency and Soldier Survival Skills subscales of the READI-R-AFN [SF] ( $r = 0.62 - 0.83$ ). Therefore, these subscales were specified as a separate Skills component of Individual Medical Readiness. In addition, subscale scores from the Group Integration and Identification, Personal/ Psychosocial/Physical, and Leadership and Administrative Support had similar bivariate correlations ( $r = 0.41 - 0.50$ ), and thus were specified as indicators of a second component called Relationships, of Individual Medical Readiness.

When this revised model was tested with the data, Goodness of Fit indices all improved, and indicated a good fit of the model to the data. The final measurement parameter estimates presented in standardized form is shown in Figure 9.

Figure 9

READI-R-AFN Short Form [SF]  
Measurement Model With Goodness of Fit Statistic Results



The modified model results of the READI-R-AFN [SF] displayed in Table 23, shows factor loadings were greatest for skills, which also account for the greatest variance in the model. When reviewing the correlation (PHI) matrix in the completely standardized solution shown in Figure 9, the Skills Factor and Relationship Factor are significantly correlated,  $r = 0.75$ , supporting the hypothesis of a relationship between the higher order factors Individual Medical Readiness measured by the READI-R-AFN [SF].

Table 23 provides a summary of overall measurement model goodness of fit indices for the original hypothesized model of the READI-R-AFN [SF] and the modified version of the READI-R-AFN [SF]. The chi square difference test is used to evaluate the significance of the improvement in fit when a path is added based on empirical findings. The fit of the new model is significantly better than that of the original as shown in Table 23. The correlation of two higher order factors supports the multidimensional nature of the construct of Individual Medical Readiness (IMR).

Table 23

Chi Square Difference Test Results of the Hypothesized Model of the READI-R-AFN [SF] and Modified Model of READI-R-AFN [SF]

N=205	Model	$\chi^2$	$\chi^2/df$	CFI	NFI	RMSEA	$\chi^2$ diff
	Original apriori	49.04** df=9	5.45	.99	.99	.15	
	Skills & Relationship Covary	13.50 df=8 p=.096	1.69	.999	.99	0.058	35.54** Change in df=1

\*\* p< .001

### Hypothesis Testing for Validity

It was hypothesized that individuals with positive emotional balance on the Derogatis Affects Balance Scale (DABS) (Derogatis, 1975; 1996) and absence of dysphoric emotional conflict and psychological distress on the Brief Symptom Inventory-18 (BSI-18) (Derogatis, 1993, 2000) would demonstrate higher readiness scores on the READI-R-AFN [SF].

As found in the initial pilot testing, bivariate correlations of scores from the READI-R-AFN [SF] with scores from the DABS (Derogatis, 1975; 1996) and scores from the BSI-18 (Derogatis, 2000) were in the expected direction. Significance was again found primarily in the negative direction with the BSI-18 subscales and negative aspects of the DABS when correlated with all subscale scores of the READI-R-AFN. Significant positive correlations were still found with positive affects scores of the DABS and scores on the Personal/Psychosocial/Physical and Group Integration and Identification subscales of the READI-R-AFN. The same remaining measures as identified in the pilot study were found to reveal correlations in the expected direction of the hypothesis, but did not reach significance.

Scores on the negative affective measures of the DABS and scores on all subscales of the BSI-18 were again much more significant than the positive affective measures when correlated with scores on the READI-R-AFN. As found in the pilot study, correlations of scores on both the DABS and the BSI-18 subscales related to anxiety had the most significant correlations with scores on the Personal/Psychosocial/Physical Readiness, Leadership and Administrative Support, and Group Integration and Identification subscales of the READI-R-AFN. Scores on the vigor subscale, a subscale

of positive affect, again had the most significant correlations with scores on the subscales of Personal/Psychosocial/ Physical Readiness and Group Integration and Identification of the READI-R-AFN. Item means, standard deviations, and factor loadings from the complete data for the READI-R-AFN [SF] subscales and total scale, the BSI subscales and total scale, and the DABS subscales and total scale are displayed in Table 24.

Table 24

Item Means, Standard Deviations, and Factor Loadings for the READI-R-AFN [SF]  
Subscales/Total Scale, BSI Subscales/Total Scale, and DABS Subscales/Total Scale.

N=205	M	SD	Correlations						Total Scale
			CLIN	OP	SSS	PPP	LA	GII	
CLIN	35.20	8.11	1.00						
OP	21.55	5.71	.62**	1.00					
SSS	26.03	6.29	.62**	.83**	1.00				
PPP	30.13	4.04	.32**	.49**	.49**	1.00			
LA	11.79	3.54	.19*	.37**	.42**	.42**	1.00		
GII	16.50	2.46	.35**	.52**	.45**	.50**	.41**	1.00	
Total Scale	141.19	23.20	.79**	.89**	.89**	.66**	.54**	.63**	1.00
GSI	44.87	8.36	-.16*	-.18*	-.16*	-.31**	-.23**	-.15*	-.25**
Depression	45.81	7.83	-.10	-.09	-.09	-.27**	-.16*	-.11	-.17*
Anxiety	46.02	7.59	-.20*	-.18*	-.18*	-.28**	-.26**	-.15*	-.27**
Somatization	45.43	7.91	-.11	-.20*	-.18*	-.08	-.14*	-.06	-.18*
NTOT	16.60	9.83	-.18*	-.11	-.14	-.33**	-.13	-.14	-.22*
Anxious	5.65	2.94	-.23**	-.15*	-.20*	-.35**	-.10	-.16*	-.28**
Depressed	3.93	7.75	-.02	-.07	-.08	-.27**	-.10	-.08	-.12*
Guilt	2.94	2.90	-.15*	-.06	-.06	-.20*	-.07	-.04	-.13*
Hostile	4.76	3.00	-.10	-.07	-.09	-.22**	-.07	-.04	-.15*
AEI	69.98	13.36	-.05	.01	-.02	.05	.11	.11	.02
PTOT	53.85	10.82	.07	.13	.11	.33**	.25**	.26**	.21*
Joy	13.56	2.81	.06	.11	.05	.26**	.19*	.20*	.16*
Content	13.57	2.78	.12	.09	.08	.30**	.23**	.20*	.16*
Vigor	12.92	3.22	.05	.15*	.14*	.30**	.23**	.25**	.21*
Affect	14.08	4.33	-.03	-.02	.03	.21**	.10	.06	.05
ABI	1.84	.88	.14*	.13	.13	.38**	.20*	.21*	.24**
PAR	.77	.13	.17*	.11	.10	.35**	.13	.15*	.21*

CLIN = Clinical Competency; OP = Operational Competency; SSS = Soldier Survival Skills;  
PPP = Personal/Psychosocial/Physical Preparation; LA = Leadership & Administrative Support;  
GII = Group Integration & Identification; GSI = Global Severity Index; PTOT = Positive Affects Total;  
NTOT = Negative Affects Total; ABI = Affects Balance Index; PAR = Positive Affects Ratio;  
AEI = Affects Expressiveness Index. \*\*Significant at  $p < .001$ ; \*Significant at  $p < .05$ .

### Summary

The six dimensions of Individual Medical Readiness (IMR) identified by Reineck:

- (a) Clinical Competency, (b) Operational Competency, (c) Soldier/Survival Skills,
- (d) Personal/Psychosocial/Physical Readiness, (e) Leadership and Administrative Support, and (f) Group Integration and Identification, were confirmed in both samples of

active duty AF nurses. The initial 83 items on the questionnaire in the pilot study were reduced to 40 items based on analysis of data. Two higher order factors, one pertaining to skills, and the other pertaining to relationships were found to correlate as reflected in Flannery's (1994) model. The dimensions of Clinical Competency, Operational Competency, and Soldier Survival Skills were related to the Flannery's domain of 'Mastery'. The dimensions of Personal/ Psychosocial/Physical Readiness, Leadership and Administrative Support and Group Integration and Identification were related to Flannery's domain of 'Attachment'. Ongoing testing of the READI-R-AFN [SF] is needed to further establish construct validity of the measure.



## CHAPTER V DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

### Introduction

This study examined the psychometric properties of the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN), closely following assumptions of classical measurement theory and the measurement process (Bollen, 1989). The four steps of the measurement process included: (a) Present the meaning of the concept to be measured, (b) specify the concept dimensions and the latent variables that represent it, (c ) operationalize the concept through measures that best represent it, and (d) stipulate the relationship between the measures that represent the concept and the latent variables (Bollen, 1989). This study incorporated both the traditional and alternative methods of reliability and validity assessments to evaluate the psychometric properties of the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN) and the READI-R-AFN Short Form [SF].

### Background

Cook and Campbell (1979) emphasized that inadequate preoperational explication of constructs threatens the construct validity of a study. "A precise explication of constructs is vital for high construct validity since it permits tailoring manipulations and measures to whichever definitions emerge from the explication" (Cook & Campbell,

1979, p. 65). Nunnally and Bernstein (1994) also emphasized that it is crucial to begin with a clear definition of the concept to be measured. Historically, the term readiness was used as a common military term, although a theoretical definition, or a means to operationalize the term in a manner that is measurable was not available. The program of research on the READI (Reineck, 1996; Reineck, 1998) primarily focused on addressing the need to explicate a theoretical and operational definition of Individual Medical Readiness since a theoretical foundation was not in existence to outline the concept of readiness or delineate how it would be measured. The first three steps Bollen's (1989) measurement process was accomplished in Reineck's work.

The process of Reineck's (1996) study was initiated with a thorough explication of the concept of Individual Medical Readiness (IMR) through the expertise of several Army nurses who had prior deployment experience. Focus groups were organized to discuss the concept. A content analysis of the focus group discussions resulted in six dimensions of Individual Medical Readiness that encompassed the overall preparedness or readiness required for Army nurses to be sufficiently ready to deploy. This writer's own deployment experience mirrored the dimensions discussed by Army nurses experienced in deployment preparation. Subsequently, Reineck (1998) assessed the READI in 225 Army nurses to initiate evaluation of reliability and validity.

#### Summary of Findings of the READI-R-AFN and the READI-R-AFN [SF]

The purpose of the current study was to evaluate the reliability and validity of the revised READI (Reineck, 1998), the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN) and the READI-R-AFN Short Form [SF] in a large sample of Air Force nurses. Research Questions answered by this study were:

What is the reliability of the READI-R-AFN and the READI-R-AFN [SF] based on estimates of (a) internal consistency, (b) test-retest reliability, and (c) multiple correlation coefficient ( $R^2$ )? What is the validity of the READI-R-AFN and the READI-R-AFN [SF] based on estimates of (a) confirmatory factor analysis, and (b) convergent-discriminant validity?

The initial form of the READI (Reineck, 1998) was reviewed and modified to include Air Force terminology in the item descriptions. Additional items were added to the relationship dimensions and the formatted subscales were revised according to a Likert scale to add uniformity to each subscale. Face validity of the revised READI, the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN), was addressed by mailing the READI-R-AFN electronically to thirty Air Force nurses experienced in deployment. Three experts who were involved in strategic Air Force Medical Readiness planning addressed content validity of the READI-R-AFN. The 83-item READI-R-AFN was then tested in a large sample of AF nurses for the pilot study.

The pilot study was conducted to evaluate the READI-R-AFN by testing the precursory model, starting with item analysis, and then to modify the model using causal modeling techniques (AMOS) to fit the data. The pilot study was accomplished through distribution the READI-R-AFN, the Derogatis Affects Balance Scale (DABS) and the Brief Symptom Inventory-18 (BSI-18) to a convenience sample of 350 active duty AF nurses. The DABS and BSI-18 were well-validated measures that were used for convergent validation of the revised instrument, and would contribute to construct validity of the READI-R-AFN. Pilot study results supported the creation of a scaled

down version of the READI-R-AFN Short Form [SF], which was then tested in a large sample of active duty Air Force nurses.

One hundred eighty one (181) nurses responded, resulting in a 52% response rate. Preliminary item analysis, internal consistency, test-retest reliability and Structural Equation Modeling (SEM) were completed to refine the READI-R-AFN. SEM was used to confirm the hypothesized nature of the test structure via confirmatory factor analysis (CFA). The revised version of the READI-R-AFN, the READI-R-AFN [SF] was then tested for its reliability and validity in another convenience sample of 500 active duty AF nurses. Two hundred five (205) nurses responded, resulting in a 41% response rate.

The six dimensions of Individual Medical Readiness (IMR) identified by Reineck (1998): (a) Clinical Competency, (b) Operational Competency, (c) Soldier Survival Skills, (d) Personal/Psychosocial/ Physical Readiness, (e) Leadership and Administrative Support, and (f) Group Integration and Identification, were confirmed in both samples of active duty AF nurses in the current study. The initial 83 items on the questionnaire in the pilot study were reduced to 40 items based on analysis of data. Two dimensions of Flannery's (1994) model of Stress Resistant Persons, 'Mastery' and 'Attachment', were found to be similar to two higher order factors of Individual Medical Readiness (IMR). The Skills Factor, which includes dimensions of Clinical Competency, Operational Competency, and Soldier Survival Skills was similar to the Flannery's (1994) concept of 'Mastery'. The Relationships Factor, which includes dimensions of Personal/ Psycho-social/Physical Readiness, Leadership and Administrative Support, and Group Integration and Identification, was similar to the Flannery's concept of 'Attachment'.

## Discussion

The data collected from two independent samples provided support for the reliability and validity of this recently developed measure designed to operationalize the concept of Individual Medical Readiness (IMR). Since the Air Force (AF) mandates its Medical Service will maintain a state of readiness, or preparedness for all projected worldwide missions, a means to determine and standardize this preparedness of AF nurses was of utmost importance. The Department of Defense Medical Readiness Strategic Plan (1998) emphasized its personnel must be prepared to respond quickly, move rapidly and decisively anywhere on the globe when called to do so. Confidence in a valid and reliable measure to provide a self-assessment of nurses' preparedness to fulfill this deployment requirement was made by the revision and testing of the Readiness Estimate and Deployability Index (READI) (Reineck, 1998), the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN).

### Evaluation of Reliability of the READI-R-AFN and READI-R-AFN [SF]

As indicated, the evaluation of reliability of the READI-R-AFN and the READI-R-AFN [SF] involved evaluation of reliability with the traditional measures of internal consistency, and test-retest reliability, in addition to an alternative method of multiple correlation coefficients through a structural equations approach. Each technique and its contribution to the assessment of reliability will be discussed separately. The discussion includes support for ongoing use or reasons not to use each method.

### Internal Consistency

Reliability concerns the degree of consistency or repeatability of scores on an instrument, and is essentially the converse of measurement error (Derogatis, 1997). Application of reliability estimates to self-report measures involves two crucial measures of consistency. The first measure involves consistency of items or homogeneity, which reflects similarity of items selected to represent a particular dimension (Mishel, 1989). The most frequent method used to determine internal consistency is Cronbach's coefficient alpha. The number of items on a measure has a direct impact on the average correlation of items. Generally, as the number of items on a scale increases, so does the correlation coefficient. Nunnally (1978) proposed a coefficient alpha of .70 or greater is acceptable for a new measure. Inter item correlations on a scale also must be maintained within a desired correlation range, usually between .30 and .70. Correlations greater than .70 could be an indication of redundancy, and thus these items should be deleted (Mishel, 1989).

The majority of the 83 items of the READI-R-AFN were within the limits recommended by Mishel (1989). Each subscale evaluated in the pilot study had internal consistency results of  $\alpha > 0.80$ . The high scores provide evidence of redundancy within each subscale and support the elimination of at least one item within each bivariate correlation  $> 0.70$ . Since the number of items on each scale also contribute to high correlations, the results of the Clinical Competency subscale (28 items) and the Personal/Psychosocial/Physical Readiness (24 items) may explain alpha levels  $> 0.92$ . When each subscale was reduced based on pilot study results the subscales related to

skills or competency had inter item correlations that ranged from  $\alpha = 0.69$  to  $0.87$  and subscale scores that ranged from  $\alpha = 0.87$  to  $0.94$ . The high inter correlations indicate the competency or skills subscales may still have redundancy and warrant further decrease of items to evaluate preparedness for deployment. The relationship subscales had inter item correlations that ranged from  $\alpha = 0.48$  to  $0.80$  and subscale scores that ranged from  $\alpha = 0.57$  to  $0.82$ . The inter item correlations for the relationship subscales are more within the recommended ranges described by Mishel (1989). Two of the subscales, the Leadership and Administrative Support and Group Integration and Identification, were reduced to four items each. Since greater numbers of items on a scale usually results in higher correlations, this could account for the subscale alpha coefficient of  $\alpha = 0.56$  for the Group Integration and Identification subscale. Although, the Leadership and Administrative subscale also had 4 items with  $\alpha = 0.80$ . This discrepancy is related to the likelihood of participants giving the same response on the subscale, since the frequency of similar responses increases reliability (Bollen, 1989). Satisfaction with Leadership and Administrative support was more likely to achieve similar responses by nurses evaluating preparedness for deployment. The Group Integration and Identification subscale addressed the comfort nurses would have living and working in close proximity with coworkers 24 hours a day. Since some types of individuals may be more comfortable living in groups than others, responses on the GII subscale would be more likely to fluctuate. Internal consistency evaluation is a good method to evaluate responses of participants from one sample to another for fluctuation in responses to specific subscales.

### Test-Retest Reliability

The second critical measure of consistency, or reliability involves stability over time or with repeated measurements (Derogatis, 1997). The reliability coefficient from the test-retest procedure is known as the coefficient of stability since it measures the extent subjects perform at a similar level on two separate occasions (Mishel, 1989). The test-retest results were excellent with participants who responded for the pilot study, since correlations ( $r$ ) ranged from  $r = 0.86$  to  $r = 0.98$ . This provided evidence of stability over time with the READI-R-AFN. Unfortunately, only 7 participants completed the test-retest so the results are not meaningful. The low response rate with the test-retest procedure fostered the need to reevaluate its value for the full field study. The test-retest procedure includes the underlying assumption that the true score will remain stable over time. This may not be reasonable since the true score changes in many cases (Bollen, 1989). Considering events preceding the need to prepare for a deployment, those involved may have strong feelings about leaving family, thus reactivity may occur to disrupt stability in the phenomenon that is getting measured. This is especially true when addressing attitudes and values (Bollen, 1989). Both attitudes and value were addressed with the READI-R-AFN in evaluating preparedness of nurses for deployment, therefore the test-retest procedure was not considered to have added value and was not included in the full field test. Limitations of the test-retest procedure provide further support for the use of incorporating structural equation modeling as a means to assess the reliability of a new measure.



### Structural Equation Modeling

Structural Equation Modeling was conducted to obtain multiple correlation coefficients ( $R^2$ ) as an alternative method to evaluate reliability (Bollen, 1989). When testing the READI-R-AFN, all 83 items were significant with a critical ratio (c.r.)  $> 2$  (Bollen, 1989).

The  $R^2$  values of items retained for the Clinical Competency subscale the Operational Competency subscale and the Soldier Survival Skills subscales all had coefficients  $> 0.52$ , an indication that all retained items had proportions of explained variance directly attributable to each latent construct  $> 50\%$  (Bollen, 1989). While most of the multiple correlation coefficients ( $R^2$ ) for the Personal/Psychosocial/Physical Readiness subscale, the Leadership and Administrative Support subscale, and the Group Integration and Identification were  $< 0.50$ . All items retained were significant as indicated by a c.r.  $> 2$ . The subscales related to the relationship domain of Flannery's Model of Stress Resistant Persons (1994) have items that explain less than 50% of the proportion of variance of the latent construct. Therefore, most of the variance of each construct is due to error and is unexplained.

Flannery's (1994) Model of Stress Resistant Persons can contribute to development of variables that may account for what is not measured. When the model was introduced, the domain of 'Finding Meaning' was thought to be included in the Leadership and Administrative support subscale, since this could address believing in the mission and support for one's country. The domain of 'Finding Meaning' would also be related to the Personal/Psychosocial/ Physical subscale, since this would involve what taking part in the mission would mean to a nurse's family. The domain of 'Finding

Meaning' could also be related to Group Integration and Identification if a nurse's relationship with coworkers has special significance. The literature provided extensive evidence of the importance of Group Integration and Identification in the deployed setting (Barger, 1991; Dahl & O'Neal, 1993; Kalisch & Kalisch, 1976; Kalisch & Kalisch, 1995; Norman, 1986; Norman, 1990; Norman, 1999; Scannell-Desch, 1996).

#### Evaluation of Validity of the READI-R-AFN and READI-R-AFN [SF]

Integral to the validation of a new measure is the process of construct validation. Construct validation, according to Nunnally and Bernstein (1994) is "an ever widening network of circumstantial evidence that points to the fact that the instrument does in fact validly operationalize the construct in question" (p. 104). The process of validation involves numerous experiments or research studies to provide the evidence that the instrument designed to measure a particular construct does indeed measure the construct it is designed to measure. Nunnally and Bernstein (1994) call this process "explication" of a construct rather than simply "validation". It involves a program of evidence that makes the construct explicit through observable variables. The more the variables described are observed in real world situations, the more evidence one has that the construct is operationalized by the measures devised to measure a particular construct. Variables that pertain to a construct are operationalized through specific measures designed to quantify aspects of the variable. Repeated administration of the measures in real world settings gathers the necessary evidence that the measures specified truly measure the desired construct. When statistically gathering this evidence, if high scores are obtained often, the more evidence one has that the variables designated are truly

measures of the construct in question. Classical types of validity include content, criterion, convergent and discriminant and construct validity (Bollen, 1989). In this study, content and convergent and discriminant validity are discussed as the methods that contribute to the overall construct validity of the latent construct 'Individual Medical Readiness'.

#### Content Validity

"Distribution of scores ought to display a wide range, large variance, and a shape resembling that of a normal distribution" (Waltz, Strickland, & Lenz, 1991, p. 151). The majority of the 83-item version of the READI-R-AFN had a wide distribution of responses. Several items had skewed distributions and contributed to the low inter item correlations, resulting in elimination of items from the scale. Items in the Leadership and Administrative Support subscale and some of the items in the Group Integration and Identification subscale were worded positively, for example, Item LA77 stated, "It is critical that my deployment commander keeps me informed of all pertinent information". Participants were more likely to agree with such positively worded statements; as a result, the majority of responses were rated 'highly agree' or 'totally agree' in the pilot study and did not discriminate. Items were reworded to improve the scale upon consultation with an expert in the preparation of Air Force nurses for deployment. Reworded items were included with remaining items retained for the final version of the READI-R-AFN following revisions indicated by the pilot study.

#### Convergent and discriminant validity

Since construct validation is never fully realized due to the abstract nature and complexity of constructs, ongoing evaluations must be conducted to learn more about the

construct and to test its predictions (Portney & Watkins, 2000). There are numerous methods available to acquire this ongoing evidence. As part of the instrument validation process, selection of a measure with substantial evidence of its reliability and construct validity to test hypothesized relationships is crucial (Strickland, 1999). As addressed previously, one technique of evaluating such relationships is through convergent validation (Nunnally & Bernstein, 1994). Through convergent and discriminant validity well-validated measures are used to provide evidence that similar traits correlate positively and dissimilar traits correlate negatively (Bollen, 1989; Derogatis & Lynn, 1999).

This study tested the hypothesis that individuals with positive affects balance on the Derogatis Affects Balance Scale (DABS) (Derogatis, 1975; 1996a) and absence of dysphoric emotional conflict on the Brief Symptom Inventory-18 (BSI) (Derogatis 1993; 2000), would demonstrate higher readiness scores on the READI-R-AFN and the READI-R-AFN [SF]. The hypothesis was supported as part of convergent validation of the READI-R-AFN and READI-R-AFN [SF]. Bivariate correlations were in the expected direction, with the absence of dysphoric emotional conflict as more of significant indicator of higher scores on the READI-R-AFN and READI-R-AFN [SF]. The subscales that related to Flannery's (1994) domain of 'Attachment', Personal/Psychosocial/Physical Readiness, Leadership and Administrative Support and Group Integration and Identification had the most significant bivariate correlations when correlated with the latent constructs of affects balance and absence of psychological distress.

### Use of Structural Equation Modeling Techniques

Structural Equation Modeling (SEM) is an alternative to classical validity measures (Bollen, 1989). SEM was used to conduct a CFA and provided evidence that use of structural equations approach was an acceptable method to evaluate reliability and validity of the READI-R-AFN and the READI-R-AFN [SF] (Bollen, 1989). Structural equations used with each measurement model which contained individual items of each subscale showed significant results for all 83 items of the READI-R-AFN since critical ratios for each item were  $> 2.0$ . In addition, the factor loadings were all significant, greater than .40, which indicates the items measure what they were intended to measure (Stevens, 1996). With overall testing of the hypothesized model with the data, the chi-square was significant, indicating limited model fit. The RMSEA results were also elevated, therefore suggestive of lack of fit of the model to the data. Since Stevens (1996) cautioned using the chi square statistic as the only method to assess model fit, the Comparative Fit Index (CFI) and the Normative Fit Index (NFI) were also assessed for each measurement model. Results were greater than the 0.90 indicated as an acceptable indicator that the model fits the data (Bollen, 1989; Kline, 1998; Stevens, 1996). Overall, model fit provides evidence of the need to modify the READI-R-AFN.

### Readiness Estimate and Deployability Index

#### Revised for Air Force Nurses, Short Form (READI-R-AFN [SF])

Flannery's (1994), domains of mastery, attachment and meaning as key ingredients of the "stress resistant person" were consistent with the measurement models of both the READI-R-AFN and READI-R-AFN [SF] that were tested for reliability and validity through structural equation modeling (SEM) techniques. The 3 skills subscales,

Clinical Competency ( $\lambda=0.68$ ,  $R^2=0.46$ ), Operational Competency ( $\lambda=0.92$ ,  $R^2=0.84$ ), and Soldier Survival Skills ( $\lambda=0.90$ ,  $R^2=0.82$ ) are related to Flannery's (1994) element of 'Mastery'.

The remaining 3 subscales, which relate to Flannery's (1994) element of 'Attachment' are Personal/Psychosocial/Physical Readiness ( $\lambda=0.71$ ,  $R^2=0.51$ ), Leadership and Administrative Support ( $\lambda=0.58$ ,  $R^2=0.33$ ), and Group Integration and Identification ( $\lambda=0.71$ ,  $R^2=0.50$ ). In addition, the variance not explained in the Leadership and Administrative Support subscale (67%) could possibly be explained by the 'Meaning' element of Flannery's 'Model Stress Resistant Persons'.

It is important to avoid use of lengthy questionnaires if possible in the development of self-report measures in an effort to avoid respondent burden. The psychometric properties are the key parameters that need to be considered, and if reliability of a measure can be maintained at alphas  $> 0.70$  with fewer items, efforts should be made to achieve that end. In this study, using a decision table that included regression weights and  $R^2$  as cutoff points proved to be a successful means to guide retention of items that maintained acceptable reliability alpha coefficients in a revised measure that removed over half of the original items. Some subscales could possibly be reduced further as part of the ongoing process of evaluating the construct validity of the READI-R-AFN [SF]. Model fitting in this and future investigations can still be improved and should be accomplished to increase the amount of variance explained by the model. The results showed that the READI-R-AFN [SF] measurement model had theoretical relevance, adequate empirical fit with significant parameters. Modifications made to the

model with indices specified during data analysis indicated a good fit of the model to the data. The explained variance of the attachment subscales remained limited. The measure requires further testing to demonstrate it can be replicated in different samples.

#### Significance of study

Based upon the findings of this study, elements essential for Air Force nurses facing military deployment, are (a) mastery of clinical skills, (b) attachment through personal, social, and leadership support, and (c) finding meaning through belief in the military mission. Although the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN) does not directly assess the domains of the stress resistant person as described by Flannery's (1994) 'Model of Stress Resistant Persons', a relationship was found empirically in this study by using structural equation modeling to evaluate the READI-R-AFN and the READI-R-AFN [SF]. The domain of 'Mastery' was depicted in items that measure the latent constructs of (a) Clinical Competence, (b) Operational Competence, and (c) Soldier Survival Skills in the READI-R-AFN and READI-R-AFN [SF]. The domain of 'Attachment' was depicted in items, which measure the latent constructs of (d) Personal/Psychosocial/Physical Readiness, (e) Leadership and Administrative Support, and (f) Group Integration and Identification. The domain of 'Finding Meaning', although not measured as part of the model is evidenced in items measuring Leadership and Administrative Support. For this construct, adding items that reflect concern with the nature of the specific mission and supporting one's country might help to further explain readiness for deployment.

Using the results of the READI-R-AFN [SF], and interpretation of the 'Model of Stress Resistant Persons' (Flannery, 1994) could facilitate preparation of active duty Air

Force nurses for military deployment missions by developing interventions to foster the development of stress resistant nurses. The importance of addressing stress related to deployment was addressed in Turner's (1998) work when she recounted chief nurses' experiences while deployed in support of Military Operations Other Than War (MOOTW).

Due to the current international climate, and with humanitarian missions, and conflicts occurring simultaneously throughout the world, deployments supporting Military Operations Other Than War occur frequently, and are very much a part of the future for Air Force nurses. Specific instructional interventions guided by Flannery's (1994) recommendations to better prepare nurses as stress resistant persons would result in individuals who would be more likely to take action to fulfill the course requirements and specifications detailed by the Air Force to prepare themselves for deployments. Interventions to (a) decrease life stress by techniques to reduce the stress response, (b) improving competency in specific skills to gain reasonable mastery of the individual's job responsibility and (c ) help individuals develop attachments to group members with whom they may be assigned.

Therefore, development of a valid and reliable self-assessment measure of Air Force nurses estimation of their readiness for deployments would provide Air Force commanders with a diagnostic tool that can be used to pinpoint specific areas where deployment preparation is needed. Sustaining medical support for military deployment missions requires timely and accurate information necessary for rapid mobilization and strategic deployment of personnel (Department of Defense, 1998). Currently a Medical Readiness Decision Support System (MRDSS) provides ratings on military units to



specify the percentage of individuals in each unit who are trained or not. A valid and reliable self-assessment measure of Air Force nurses level of preparedness would facilitate this process.

Results of the Structural Equation Modeling (SEM) conducted with the READI-R-AFN [SF] support reports of feedback provided in the literature by nurses deployed in a wartime setting. Stanton-Bandiero (1998) showed clinical skills were given the highest priority for the training necessary prior to a deployment for these nurses. Nurses' wartime experience throughout history has further supported the need to prepare nurses clinically when sending them to perform in the deployment setting (Concannon, 1992; McRae-Bergeron, et al., 1999; Norman, 1986; Scannell-Desch, 1996; & Stanton-Bandiero, 1998). In a study assessing mass casualty triage knowledge of military medical personnel, Janousek, Jackson, Lorenzo, and Coppola (1999) identified nurses scored the lowest in providing mass casualty care. The authors stressed the importance of training medical personnel in the art of triage as a necessary wartime skill.

Stuart and Halverson (1997) obtained psychological symptom measures using the Brief Symptom Inventory (Derogatis, 1993) from samples of soldiers, which included nurses, who deployed to operations in the Persian Gulf, Somalia, Kuwait, Haiti, and Bosnia. The total sample that combined data collected from five separate deployments consisted of 1,279 female soldiers and 8,884 male soldiers. Results revealed that individuals who were deployed had significantly elevated levels of psychological distress while deployed, when compared to their non-deployed counterparts. Gender differences were not significant in this study. Stretch, Vail, and Maloney (1985) reported that nurses during Vietnam experienced rates of psychological distress similar to that of their

construct of neuroticism (Derogatis & Fleming, 1998) have shown evidence of impaired levels of preparedness or readiness. One could assume that traits such as vulnerability to stress, psychological symptoms of distress, and negative affects would be an impediment to high levels of readiness. When correlating the READI-R-AFN and READI-R-AFN [SF] scores with scores on the DABS (Derogatis, 1975; 1996a) and the BSI-18 (Derogatis, 1993; 2000) the negative affects scores of the DABS and the anxiety scores of the BSI-18 had the most significant ( $p < .001$ ) correlations with scores on the READI-R-AFN/AFN[SF]. In other words, those with the lowest scores on negative affects and anxiety had the highest scores on the READI-R-AFN/AFN[SF].

One possibility to further develop the READI-R-AFN [SF] in an effort to account for the unexplained variance would be to create items that would highlight these enabling and impeding characteristics. The dimensions of Individual Medical Readiness measured by the scores on the READI-R-AFN [SF] should improve the predictive validity of the measure. The READI-R-AFN[SF] provides a measure of an individual's perception of readiness for deployment. For practical use of the instrument, it would be helpful to know if higher levels of preparedness as indicated by higher scores on the READI-R-AFN [SF] (a) would predict greater skills performance on deployment; or (b) if higher scores on the READI-R-AFN [SF] predict greater levels of stress resistance while the individual is deployed. Do higher scores predict greater satisfaction in accomplishing the mission? Knowledge of such predictive ability of the READI-R-AFN [SF] scores is critical to the overall construct validity of the construct of Individual Medical Readiness. If the measure does not have any predictive ability, its use is limited.

Therefore, the first objective is to improve the relationship dimensions of the

READI-R-AFN [SF] related to Flannery's (1994) 'Attachment' domain. Incorporating items that pertain to finding meaning in the experience could possibly help explain the variance that is not explained by the current items included in the measure.

Once the READI-R-AFN [SF] is improved by finding items that account for more of the variance in the construct of IMR, then efforts can be pursued to address the predictive ability of the measure. The program of research can address whether the READI-R-AFN [SF] makes a difference on both an individual and group level. Overall group scores of levels of preparedness can be compared since there are summary scores for each subscale and for the total scale. The future program of research also includes the need to address plans for the READI-R-AFN [SF] as a part of the bigger picture in readiness for deployment.

The Skills component of the READI-R-AFN [SF] has shown excellent results pertaining to reliability both via internal consistency and SEM. This has implications for use in the clinical or operational setting surrounding preparation for deployment. Stanton-Bandiero (1998) identified that clinical skills were given the highest priority for prewar training. Emotional and coping skills were ranked second in priority, which supports the need to improve the relationship factor since dimensions on this factor included items related to coping skills. In a phenomenological study on the experience of Chief Nurses in deployed settings in support of Military Operations Other Than War, Turner (1998) identified the importance of translating clinical skills into a variety of situations. The ability to adapt to the minimal technology available in the field environment when comfortable with the practice of nursing care using advanced technology was identified as especially problematic. The items on the READI-R-AFN

[SF] include questions related to working with limited technology in the field setting.

Use of the READI-R-AFN [SF] prior to placement on mobility; and following practice of mobility exercises and participation in courses to prepare nurses for the field environment would allow collection of data on the conditions that enable nurses to self-identify higher readiness scores.

The underlying domain structure of the READI-R-AFN and the evaluation of the degree to which each item is related to the hypothesized domain now have preliminary support from two independent samples, although both of a moderate size by SEM standards. The strongest relationships were shown to between the latent constructs of Clinical Competency, Operational Competency, and Soldier Survival Skills of the READI-R-AFN and the READI-R-AFN [SF] that pertain to particular deployment skills, or 'Mastery' according to Flannery's (1994) Model of Stress Resistant Persons. These subscales correlated strongly with each other and provide support for further refinement of the measure. The inclusion of the weaker subscales is supported theoretically based on experiential reports of nurses taking part in prior deployments. 'Attachment' was shown as an important component of readiness preparation (Concannon, 1992; Scannell-Desch, 1996; & Norman, 1990). In addition, attachment was found to contribute to nurses' overall survival and post-deployment adjustment. Stanton-Bandiero (1998) found that one hundred percent (100%) of respondents in her study on nurses self-report of war experiences identified that support from colleagues was most crucial to their overall well being and survival during the war and to their ability to adjust upon their return home.

instrument which commanders can use to identify the degree to which nurses are prepared for the expectations of short-notice readiness missions. Further evaluation would confirm and/or extend the validity and the practicality of the instrument for systematic assessment of nurses' levels of preparedness for deployment. Further studies are needed to provide ongoing construct validity of the READI-R-AFN [SF] and to support that the measure is sensitive to intervention induced change.

## APPENDICES

1. Readiness Estimate and Deployability Index (Reineck, 1998)
2. Readiness Estimate and Deployability Index Revised for Air Force Nurses
3. Derogatis Affects Balance Scale (DABS) (Derogatis, 1975; 1996)
4. Brief Symptom Inventory-18 (BSI-18) (Derogatis, 1993; 2000)
5. Documents for Protection of Human Subjects and Letters of Administrative  
Approval for Data Collection
6. Item Frequencies and Percent Response of READI-R-AFN scales
7. Readiness Estimate and Deployability Index Revised for Air Force Nurses Short  
Form (READI-R-AFN [SF])
8. Item Means, Standard Deviations, and Bivariate Correlations of the READI-R-  
AFN Subscales
9. Item Frequencies and Percent Response of the READI-R-AFN
10. Item Frequencies and Percent Response of the READI-R-AFN [SF]
11. Item Means, Standard Deviations, and Bivariate Correlations of the READI-R-  
AFN Subscales
12. AMOS Estimates with Maximum Likelihood: Standardized Factor Loadings,  
Standard Errors and Critical Ratios for the READI-R-AFN [SF]

## Appendix 1

## Readiness Estimate and Deployability Index (Reineck, 1998)

**Demographic Data**

1. What is your current group? (check one)

☐ Active Component ☐ Army National Guard

☐ U.S. Army Reserve Troop Program Unit

☐ Other \_\_\_\_\_

2. What is your area of concentration (AOC), if an officer, or military occupational specialty (MOS), if enlisted?

(check one)

☐ 66C - Psychiatric Nurse ☐ 66E - Perioperative Nurse

☐ 66F - Nurse Anesthetist ☐ 66H00 - Medical-Surgical Nurse

☐ 66H8A - Critical Care Nurse ☐ 66H8D - Nurse Midwife

☐ 66H8E - Nurse Practitioner ☐ 66H8F - Community Health Nurse

☐ 66H8G - OB-GYN Nurse ☐ 66HM5 - Emergency Nurse

☐ 91B Medical Specialist ☐ 91C Licensed Practical Nurse

☐ 91D - Surgical Technician ☐ 91X - Behavioral Health Technician

3. If enlisted, are your MOS qualified? That is, if you are assigned in a position that calls for a certain MOS, is that the MOS in which you are qualified?

☐ Yes ☐ No

4. How many years, military and civilian experience, do you have in the nursing AOC/MOS you checked in question number 2 above?

\_\_\_\_\_

5. To what major command are you assigned? (check one)

☐ USA Medical Command (including Europe, Japan and AMEDD Center and School) ☐ USA Forces Command ☐ US Army Europe and Seventh Army

(USAREUR) ☐ US Army Reserve (USAR) ☐ Army National Guard (ARNG)

☐ 8th US Army, Korea ☐ Other \_\_\_\_\_

6. If you are assigned to USA Medical Command, are you a professional filler (PROFIS)?

(check one)

☐ Yes ☐ Uncertain ☐ No

Appendix 1 (cont)  
Readiness Estimate and Deployability Index (Reineck, 1998)

7. What is your military rank?

- ☐ 01 2nd Lieutenant ☐ 02 1st Lieutenant ☐ 03 Captain  
☐ 04 Major ☐ 05 Lieutenant Colonel ☐ 06 Colonel  
☐ E1-E3 Private, Private E-2, Private First Class  
☐ E4 Specialist ☐ E5 Sergeant ☐ E6 Staff Sergeant  
☐ E7 Sergeant First Class ☐ E8 Master Sergeant  
☐ E9 Sergeant Major

8. Are you male or female?

- ☐ Male ☐ Female

9. What is your racial background?

- ☐ American Indian, Eskimo or Aleut ☐ Asian or Pacific Islander  
☐ Black ☐ White ☐ Other race

10. Are you of Hispanic/Spanish origin or ancestry (of any race)?

- ☐ Yes ☐ No

11. To what type of unit are you assigned ? MARK ONE.

- ☐ TO&E Unit. A tactical unit which may be/is deployed for combat.  
☐ TDA Unit. ☐ I do not know.

12. What is your deployment status?

- ☐ I am currently deployed.  
☐ I am not deployed but will deploy within 90 days.  
☐ I am not deployed at this time and will not likely  
deploy in the next 90 days. ☐ Other

13. Have you ever been deployed in your current AOC/MOS?

- ☐ Yes ☐ No

14. What is your age? (fill in blank) \_\_\_\_\_

### Section One

#### Clinical Nursing Competency

1. How familiar are you with the different types of shock? (circle the number)

- ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2. How competent are you in caring for patients in hemorrhage shock?  
(circle the number)

- ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5



## Appendix 1 (cont)

## Readiness Estimate and Deployability Index (Reineck, 1998)

3. Consider this situation. You are deployed. You get to the scene of a MASCAL. There is ground ambulance support. There is one person who appears to have been injured in the leg. The patient is losing a steady stream of blood. The patient's vital signs are stable now. You placed a dressing over the wound, but you noticed you have to keep re-enforcing it. The ambulance driver wants to know if the patient can wait for the next run to the treatment facility or if the patient has to go immediately. What is your assessment? (Check one)
- ☐ The patient can wait for the next ambulance.
  - ☐ Patient is stable.
  - ☐ Patient has to go on the first ambulance.
  - ☐ Increased potential for Hypovolemic shock.

*Clinical Documentation*

4. Circle the number that represents your competency with clinical documentation (use of SF 510, 511) in a field environment.

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

1. When was the last time you provided direct patient care? (check one)

☐ More than 4 years ago   ☐ Within the most recent 1-4 years  
☐ Within the last year, but more than 6 months ago   ☐ Within the last 6 months

2. What type(s) of triage experiences and education have you had?  
(check all that apply)

☐ I have not learned about triage yet  
☐ Learned through military or civilian courses (i.e. EFMB, OAC, Medical Management of Chemical Casualties Course, etc.)  
☐ Learned through inservices, nursing courses, journals, handouts, etc.  
☐ Practiced triage in an ED setting  
☐ Practiced triage in a field environment on real and/or moulaged patients

3. How competent are you to calculate an IV drip without your calculator or drug book?

(check one)

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

## Appendix 1 (cont)

## Readiness Estimate and Deployability Index (Reineck, 1998)

4. When was the last time you had to reconstitute medications, calculate dosages, and administer an IV medication?

(check one)

- ☐ More than 4 years ago  
☐ Within the most recent 1-4 years  
☐ Within the last year, but more than 6 months ago  
☐ Within the last 6 months

5. How competent are you to institute standing orders based on your ability to assess patients? For example, ordering x-rays, starting IV fluids, administering medications, etc. without immediate contact with a physician? (circle the number)

- ☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

6. How competent are you to perform in a code/emergency situation?

(check one)

- ☐ Not Competent (Would assist if someone told me exactly what and how to do it)  
☐ Competent (Provided another nurse helped me, i.e. helped with drug calculations, assisted with medication administration or patient monitoring)  
☐ Very Competent (Could provide nursing care requirements without supervision or with minimal assistance)

7. Do you understand the concept of body surface area in relation to a burn patient and are you competent in calculating it? (check one)

- ☐ No, don't know what it is nor how to calculate it.  
☐ Heard of it before, but not able to calculate it.  
☐ Know a little about it and may be able to calculate it.  
☐ Understand it and probably could calculate it.  
☐ Understand it and can calculate it.

On a 1 to 5 Scale; 1-NOT competent to 5-TOTALLY competent  
(circle the number)

8. How competent are you when deciding which critically ill or injured patients get seen first?

- ☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

9. Consider a situation if a doctor is not present. How competent are you in performing ACLS protocols?

- ☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

**Section Two**  
**Operational Nursing Competency**

Consider this situation. The 4 limb electrodes of a cardiac monitor-recorder are attached to a patient and you have just obtained an EKG tracing in the field. You have been asked to obtain a 12-lead EKG on the patient. You have the following equipment and supplies: Field table; cardiac monitor; 4 metal limb electrodes attached to patient with holding straps; 1 suction cup electrode; 1 tube of electrode gel; 1 roll of recording paper; 1 box of alcohol pads; 1 patient on a hospital bed.

1. How competent are you to obtain a 12-lead EKG using the appropriate procedure and equipment described above?

(circle the number)

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

Consider this situation. You are providing patient care in a field environment and need to suction oropharyngeal secretions from a patient. You have the following equipment and supplies: field table; 1 portable oropharyngeal suction apparatus; sterile patient suction tubing and suction catheter; 1 small container of water; 1 pair of clean gloves.

2. Are you competent operating a suction apparatus that uses an internal battery pack? (check one)

☐ Yes   ☐ No

Circle the number that indicates your level of competence in these operational areas:

3. Evacuation Procedures

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

4. Eschelon of Care

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

5. Reporting an unlawful act or conduct

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

Appendix 1 (cont)  
Readiness Estimate and Deployability Index (Reineck, 1998)

6. Field Sanitation and Hygiene

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

7. DEPMEDS Setup

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

8. Dealing with the unexpected - contingency management

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

9. Improvising in the clinical area

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

**Section Three**

**Soldier/Survival Skills**

1. Circle the number that represents how familiar you are with the M16-rifle.

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

2. Circle the number that represents how familiar you are with the 9mm pistol.

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

3. How competent are you in your ability to defend yourself and/or your patient(s) if called upon to do so?

(circle the number)

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

4. I am competent and confident in my ability to protect myself and my patients using the M40 mask and MOPP gear

(circle the number)

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

5. How competent are you in your ability to navigate using a map and compass? (circle the number)

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

6. How competent are you in your ability to maintain your individual weapon in working order? (circle the number)

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

## Appendix 1 (cont)

## Readiness Estimate and Deployability Index (Reineck, 1998)

7. How competent are you in your ability to perform your primary military specialty under adverse and/or prolonged field conditions?

(circle the number)

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

8. How competent are you in your ability to decontaminate yourself and your patient(s) using standard Army decontamination equipment? (circle the number)

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

9. Circle the number that represents how familiar you are with your status under the Geneva Convention, should you be captured by enemy forces.

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

10. If you were captured, how competent are you in your ability to resist the enemy?

(circle the number)

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

11. Circle the number that represents your familiarity with standard Army communications equipment. (i.e. field radio)

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

12. How competent are you to clear your weapon?

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

Section Four - A

Personal and Physical Readiness

1. Are you up to date on routine gender specific exams?

☐ Yes   ☐ No   ☐ not sure

2. What is your exercise frequency?

☐ at least 3-5 times a week   ☐ twice a week   ☐ once a week

☐ less often than once a week

3. What is your dental fitness category?

☐ Dental Fitness Class 1 - soldier requires no dental treatment

☐ Dental Fitness Class 2 - soldier's existing dental condition is unlikely to result in a dental emergency within 12 months.

☐ Dental Fitness Class 3 - soldier requires dental treatment to correct a dental condition that is likely to cause a dental emergency within 12 months.

☐ Dental Fitness Class 4 - soldier requires a dental exam. Has not had a dental exam within the last 13 months.

Appendix 1 (cont)  
Readiness Estimate and Deployability Index (Reineck, 1998)

4. Check the box which represents how long ago it was that you had a physical exam.

- ☐ 1-12 mos. ago ☐ 1-5 years ago  
☐ longer than five years ago

5. If indicated, do you have a family care plan?

- ☐ Yes ☐ No ☐ Not Applicable

6. Are you a member of a dual Army couple?

- ☐ Yes ☐ No

7. Do you have a physical profile?

- ☐ Yes ☐ No

8. If yes to the above question, does your profile prevent you from completing your duty?

- ☐ Yes ☐ No ☐ Not Applicable, I do not have a profile.

9. If you have a profile, is it current, accurate, complete, and signed by a physician?

- ☐ Yes ☐ No ☐ Not Applicable, I do not have a profile

10. Do you have medical problems for which you don't have a profile but which you are very concerned about if you are deployed?

- ☐ Yes ☐ No ☐ Not Applicable

11. Are you undergoing a medical board?

- ☐ Yes ☐ No

12. Have you completed soldier readiness processing in the last year?

- ☐ Yes ☐ No

**Section Four - B**  
**Psychosocial Readiness**

*FAMILY*

1. Circle the number that best describes the quality of your current family support system

(i.e. family support group, friends or family)

- ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Appendix 1 (cont)  
Readiness Estimate and Deployability Index (Reineck, 1998)

2. If you are deployed, will the same family support system in the above question be available? (check one)

☐ Yes ☐ No

3. Have you ever been separated for more than 6 months from your family/significant other? (check one)

☐ Yes ☐ No

4. If yes to the above question, describe your family's overall response to your separation. (circle the number)

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

*LEGAL (Yes/No; check one)*

1. Do you have a current will?

☐ Yes ☐ No

2. Do you have a current power of attorney?

☐ Yes ☐ No

3. Do you have any pending legal matters, i.e. divorce or other legal problems?

☐ Yes ☐ No

*OCCUPATIONAL*

1. Describe your current working relationship with co-workers in your deployment unit.  
(circle the number)

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

2. Describe your overall feeling about your past deployment experience?  
(circle the number)

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

*CURRENT STRESSORS  
AND COPING STRATEGIES*

Deployment brings with it stress and challenge which tend to compound pre-deployment stressors. How much stress are you experiencing in the following areas:

(circle the number)

1. Main Work

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

2. Family

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

3. Finances

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

4. Other

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

5. Do you know how to access emotional support while deployed?

☐ Yes ☐ No

6. To which of the following would you turn for coping with stress?

(check ALL that apply)

☐ Tobacco   ☐ Physical Exercise   ☐ Relaxation/Meditation Techniques  
☐ Talking with Friends   ☐ Religious Faith   ☐ Other \_\_\_\_\_

7. Do you know how to access mental health service while deployed?

☐ Yes ☐ No

To what extent are you prepared for:

8. Death, dying, and carnage

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

9. Your own possible death

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

10. Battle stress

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5



Appendix 1 (cont)  
Readiness Estimate and Deployability Index (Reineck, 1998)

## 11. Weather extremes

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

## 12. Long hours

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

## 13. Lack of privacy

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5**Section Five****Leadership and Administration Support***Administration*

1. If you were deployed with a unit that you are not currently assigned or PROFIS to, you would understand the set up, functions, and all of the areas that fall under the command structure of the TOE unit.

(check one)

☐ Strongly Agree   ☐ Agree   ☐ Neutral   ☐ Disagree   ☐ Strongly Disagree

2. If you are a single parent or dual military IAW (means 'in accordance with') AR 600-20, you are required to have a Family Care Plan. If you were called today and given notification that you were to deploy next week, how confident are you that you could activate and make your Family Care Plan work for the entire deployment (up to 9 months)? (check one)

☐ Totally Confident   ☐ Confident   ☐ Somewhat Confident  
☐ Unsure that it would work for a long period of time (over six months)  
☐ Unsure that it would work as it is set up now  
☐ Not Confident at All  
☐ Not Applicable; I am not a single parent nor dual military.

**Leadership**

1. Check the box that represents how you rate your deployment unit first-line leader's knowledge and concern for the soldiers as described in the leadership principle: "Know your soldiers and look out for their well-being."

☐ Very knowledgeable and concerned  
☐ Somewhat knowledgeable and concerned  
☐ Not knowledgeable and unconcerned

## Readiness Estimate and Deployability Index (Reineck, 1998)

2. Check the box that represents how you would rate your deployment unit first-line leader's acceptance of responsibility to ensure that safe, tough, realistic training was conducted which adhered to the highest standards, habits and discipline.

- ☐ High sense of responsibility  
☐ Moderate sense of responsibility  
☐ Low sense of responsibility

3. Check the box that represents how you rate your deployment unit first-line leader's ability to keep you informed.

- ☐ Leader keeps me very well informed  
☐ Leader keeps me fairly well informed  
☐ Leader keeps me not informed at all

**Section Six****Group Integration and Identification**

1. Circle the number that represents your ability to adjust to crowded and co-ed sleeping quarters while deployed.

- ☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

2. Check the box that represents the amount of days you have had the chance to train with your deployment unit in the past 12 months.

- ☐ >14 days   ☐ 7-14 days   ☐ 2-6 days   ☐ 1 day   ☐ none

3. How familiar are you with your deployment unit's mission, vision, and values?  
(check one)

- ☐ Very Familiar   ☐ Familiar   ☐ Neither/Nor   ☐ Somewhat Familiar  
☐ Not Familiar at All

4. How familiar are you with your role/duty assignment within your deployment unit?  
(check one)

- ☐ Very Familiar   ☐ Familiar   ☐ Neither/Nor   ☐ Somewhat Familiar  
☐ Not Familiar at All

## Appendix 2

## Readiness Estimate and Deployability Index Revised for Air Force Nurses

Please rate your level of competency according to the following scale	Please completely circle the item to indicate your response
1=I would need theory, demonstration and supervised practice 2=I would need review and supervised practice 3=I would need some review and little supervision 4= I would need review only 5=I would need no review or supervision	<b>Scale for competency</b> 1= Not Competent 2= Minimally Competent 3= Moderately Competent 4= Highly Competent 5= Totally Competent
1. How competent are you in treating patients in hypovolemic shock?	Not Competent   1   2   3   4   5   Totally Competent
2. How competent are you in your role as a nurse in a mass casualty (MASCAL) situation?	Not Competent   1   2   3   4   5   Totally Competent
3. How competent are you with documentation of a patient's condition on a Field Medical Card?	Not Competent   1   2   3   4   5   Totally Competent
4. How competent are you with the current field technology for clinical documentation (i.e. CHCS II, Pic card)?	Not Competent   1   2   3   4   5   Totally Competent
5. How competent are you with calculating an IV drip without your calculator or drug book?	Not Competent   1   2   3   4   5   Totally Competent
6. How competent are you with reconstituting medications, calculating dosages, and administering IV medications?	Not Competent   1   2   3   4   5   Totally Competent
7. How competent are you to institute standing orders based on your ability to assess patients? For example, ordering x-rays, starting IV fluids, administering medications, etc. without immediate contact with a physician?	Not Competent   1   2   3   4   5   Totally Competent
8. How competent are you to perform in emergency situations, such as those of patients in cardiac arrest?	Not Competent   1   2   3   4   5   Totally Competent
	----- Go to next page-----

## Appendix 2 (cont)

## Readiness Estimate and Deployability Index Revised for Air Force Nurses

Please rate your level of competency according to the following scale	Please completely circle the item to indicate your response
1=I would need theory, demonstration and supervised practice 2=I would need review and supervised practice 3=I would need some review and little supervision 4= I would need review only 5=I would need no review or supervision	<b>Scale for competency</b> 1= Not Competent 2= Minimally Competent 3= Moderately Competent 4= Highly Competent 5= Totally Competent
9. How competent are you with the concept of using body surface area for calculating the extent of the burns in the burn patient?	Not Competent   1   2   3   4   5   Totally Competent
10. How competent are you with principles involved in deciding which critically ill or injured patients get seen first?	Not Competent   1   2   3   4   5   Totally Competent
11. If a doctor is not present, how competent are you in performing Advanced Cardiac Life Support (ACLS) protocols?	Not Competent   1   2   3   4   5   Totally Competent
12. How competent are you taking care of life threatening injuries?	Not Competent   1   2   3   4   5   Totally Competent
13. How competent are you in providing nursing care to a multiple trauma patient?	Not Competent   1   2   3   4   5   Totally Competent
14. How competent are you in the care of patients with NBC injuries?	Not Competent   1   2   3   4   5   Totally Competent
15. How competent are you in the care of patients with ballistic missile injuries?	Not Competent   1   2   3   4   5   Totally Competent
16. How competent are you in recognition of a patient with a tension pneumothorax?	Not Competent   1   2   3   4   5   Totally Competent
17. How competent are you in the fluid resuscitation of a burn patient?	Not Competent   1   2   3   4   5   Totally Competent
18. How competent are you in performing resuscitation with blood products?	Not Competent   1   2   3   4   5   Totally Competent
19. How competent are you in the use of the field ventilator (i.e. Impact 754)?	Not Competent   1   2   3   4   5   Totally Competent
20. How competent are you with performing Airway management?	Not Competent   1   2   3   4   5   Totally Competent
21. How competent are you in implementing the triage categories?	Not Competent   1   2   3   4   5   Totally Competent
	----- Go to next page -----

## Appendix 2 (cont)

## Readiness Estimate and Deployability Index Revised for Air Force Nurses

<p><u>Please rate your level of competency according to the following scale</u></p> <p>1=I would need theory, demonstration and supervised practice  2=I would need review and supervised practice  3=I would need some review and little supervision  4= I would need review only  5=I would need no review or supervision</p>	<p><u>Please completely circle the item to indicate your response</u></p> <p><u>Scale for competency</u></p> <p>1= Not Competent  2= Minimally Competent  3= Moderately Competent  4= Highly Competent  5= Totally Competent</p>
22. How competent are you in performing in a multi-disciplinary healthcare team role?	<p>Not Competent 1 2 3 4 5 Totally Competent</p>
23. How competent are you in providing care to a non-English speaking patient?	<p>Not Competent 1 2 3 4 5 Totally Competent</p>
24. How competent are you in performing Mental Health nursing skills (i.e. care of a patient with Post-Traumatic Stress Disorder)?	<p>Not Competent 1 2 3 4 5 Totally Competent</p>
25. How competent are you in field infection control?	<p>Not Competent 1 2 3 4 5 Totally Competent</p>
26. How competent are you with Orthopedic nursing skills (i.e. care of a patient in traction)?	<p>Not Competent 1 2 3 4 5 Totally Competent</p>
27. How competent are you with Neurologic nursing skills (i.e. care of a patient with head trauma)?	<p>Not Competent 1 2 3 4 5 Totally Competent</p>
28. How competent are you in performing a complete nursing assessment and interpreting abnormal findings?	<p>Not Competent 1 2 3 4 5 Totally Competent</p>
<p>Consider this situation. The 4 limb electrodes of a cardiac monitor-recorder are attached to a patient and you have just obtained an EKG tracing in the field. You have been asked to obtain a 12-lead EKG on the patient. You have the following equipment and supplies: Field table; cardiac monitor; 4 metal limb electrodes attached to patient with holding straps; 1 suction cup electrode; 1 tube of electrode gel; 1 roll of recording paper; 1 box of alcohol pads; 1 patient on a hospital bed.</p> <p>29. How competent are you in obtaining a 12-lead EKG using the appropriate procedure and equipment described above?</p>	<p>Not Competent 1 2 3 4 5 Totally Competent</p> <p>----- Go to next page-----</p>

## Appendix 2 (cont)

## Readiness Estimate and Deployability Index Revised for Air Force Nurses

<p><u>Please rate your level of competency according to the following scale</u></p> <p>1=I would need theory, demonstration and supervised practice</p> <p>2=I would need review and supervised practice</p> <p>3=I would need some review and little supervision</p> <p>4= I would need review only</p> <p>5=I would need no review or supervision</p>	<p><u>Please completely circle the item to indicate your response</u></p> <p><u>Scale for competency</u></p> <p>1= Not Competent</p> <p>2= Minimally Competent</p> <p>3= Moderately Competent</p> <p>4= Highly Competent</p> <p>5= Totally Competent</p>
<p>Consider this situation. You are providing patient care in a field environment and need to suction oropharyngeal secretions from a patient with the following equipment and supplies: field table; 1 portable oropharyngeal suction apparatus; sterile patient suction tubing and suction catheter; 1 small container of water; 1 pair of clean gloves.</p> <p>30. How competent are you with operating the suction apparatus noted above?</p>	<p>Not Competent      1   2   3   4   5      Totally Competent</p>
<p>31. How competent are you with evacuation of patients using aero medical evacuation procedures?</p>	<p>Not Competent      1   2   3   4   5      Totally Competent</p>
<p>32. How competent are you with understanding the capacities of each Level of Care, formerly called Echelons of Care?</p>	<p>Not Competent      1   2   3   4   5      Totally Competent</p>
<p>33. How competent are you with knowing the Law of Armed Conflict (LOAC) violations that must be reported (i.e. ordered to protect patients with force)?</p>	<p>Not Competent      1   2   3   4   5      Totally Competent</p>
<p>34. How competent are you with setting up your area for Field Sanitation and Hygiene?</p>	<p>Not Competent      1   2   3   4   5      Totally Competent</p>
<p>35. How competent are you with your ability to carry out Deployable Medical Systems DEPMEDS Setup (i.e. setting up tents and equipment)?</p>	<p>Not Competent      1   2   3   4   5      Totally Competent</p>
<p>36. How competent are you with dealing with the unexpected (i.e. providing patient care in a bomb shelter if necessary)?</p>	<p>Not Competent      1   2   3   4   5      Totally Competent</p>
	<p>----- Go to next page-----</p>

## Appendix 2 (cont)

## Readiness Estimate and Deployability Index Revised for Air Force Nurses

<u>Please rate your level of competency according to the following scale</u> 1=I would need theory, demonstration and supervised practice 2=I would need review and supervised practice 3=I would need some review and little supervision 4= I would need review only 5=I would need no review or supervision	<u>Please completely circle the item to indicate your response</u> <b>Scale for competency</b> 1= Not Competent 2= Minimally Competent 3= Moderately Competent 4= Highly Competent 5= Totally Competent
37. How competent are you with the nursing care required for patients injured by weapons of mass destruction (i.e. weapons used by terrorists)?	Not Competent    1    2    3    4    5    Totally Competent
38. How competent are you with supporting humanitarian assistance?	Not Competent    1    2    3    4    5    Totally Competent
39. How competent are you with what is required of you to protect yourself and/or your patient(s) if called upon to do so?	Not Competent    1    2    3    4    5    Totally Competent
40. How competent are you in your ability to perform nursing skills while in the M40 mask and MOPP gear?	Not Competent    1    2    3    4    5    Totally Competent
41. How competent are you with decontamination procedures of a patient exposed to chemical or biologic agents?	Not Competent    1    2    3    4    5    Totally Competent
42. How competent are you in the application of Laws of Armed Conflict (LOAC) to military medicine in a deployed setting (i.e. using force to defend patients)?	Not Competent    1    2    3    4    5    Totally Competent
43. How competent are you in your ability to perform your primary military specialty under adverse and/or prolonged field conditions (i.e. limited staff to provide relief)?	Not Competent    1    2    3    4    5    Totally Competent
44. How competent are you in your ability to decontaminate yourself using standard personal decontamination equipment?	Not Competent    1    2    3    4    5    Totally Competent
45. How competent are you with your status under the Geneva Convention?	Not Competent    1    2    3    4    5    Totally Competent
	----- Go to next page -----

## Appendix 2 (cont)

## Readiness Estimate and Deployability Index Revised for Air Force Nurses

<b><u>For the following, please indicate your level of agreement according to this scale by completely circling your response</u></b>	<b><u>Scale for Level of Agreement</u></b> 1= Totally Disagree 2= Minimally Agree 3= Moderately Agree 4= Highly Agree 5= Totally Agree
46. How competent are you with use of field communications equipment (i.e. field radio)?	<b>Not</b> <span style="float: right;"><b>Totally</b></span> <b>Competent</b> 1 2 3 4 5 <b>Competent</b>
48. Maintaining dental fitness by annual dental exams is an important means to avoid costly dental emergencies.	<b>Totally</b> <span style="float: right;"><b>Totally</b></span> <b>Disagree</b> 1 2 3 4 5 <b>Agree</b>
49. Maintaining an ideal physical state with annual health maintenance exams is an important means of preventing disease and insuring good health.	<b>Totally</b> <span style="float: right;"><b>Totally</b></span> <b>Disagree</b> 1 2 3 4 5 <b>Agree</b>
50. Maintaining physical fitness by participating in 30 minutes of aerobic exercise at least 3 times a week helps prevent illness and injury.	<b>Totally</b> <span style="float: right;"><b>Totally</b></span> <b>Disagree</b> 1 2 3 4 5 <b>Agree</b>
51. It is important to keep family care plans (arrangements for care of children) up to date at all times to avoid delays in deployment processing.	<b>Totally</b> <span style="float: right;"><b>Totally</b></span> <b>Disagree</b> 1 2 3 4 5 <b>Agree</b>
52. It is important to have completed all mobility requirements in order to maintain an ideal state of preparedness for deployment.	<b>Totally</b> <span style="float: right;"><b>Totally</b></span> <b>Disagree</b> 1 2 3 4 5 <b>Agree</b>
53. I have confidence that my support system (i.e. family, friends or family support group) will meet all of my psychosocial needs.	<b>Totally</b> <span style="float: right;"><b>Totally</b></span> <b>Disagree</b> 1 2 3 4 5 <b>Agree</b>
54. If I am deployed, I have confidence that my support system (i.e. family, friends or family support group) will maintain communication with me.	<b>Totally</b> <span style="float: right;"><b>Totally</b></span> <b>Disagree</b> 1 2 3 4 5 <b>Agree</b>
55. I have confidence that my support system (i.e. family, friends or family support group) will be cared for in my absence if I am deployed.	<b>Totally</b> <span style="float: right;"><b>Totally</b></span> <b>Disagree</b> 1 2 3 4 5 <b>Agree</b>
	----- Go to next page -----



## Appendix 2 (cont)

## Readiness Estimate and Deployability Index Revised for Air Force Nurses

<u>For the following, please indicate your level of agreement according to this scale by completely circling your response</u>	<u>Scale for Level of Agreement</u> 1= Totally Disagree 2= Minimally Agree 3= Moderately Agree 4= Highly Agree 5= Totally Agree
56. It is important to have my 'Will' in order prior to a deployment.	Totally Disagree 1 2 3 4 5 Agree
57. It is important to have a legal power of attorney arranged to maintain an ideal state of preparedness for deployment.	Totally Disagree 1 2 3 4 5 Agree
58. It is important to have all legal matters attended to prior to deployment to maintain an ideal state of preparedness for deployment.	Totally Disagree 1 2 3 4 5 Agree
59. Mission success is enhanced by a good working relationship with my co-workers.	Totally Disagree 1 2 3 4 5 Agree
60. My previous deployment and/or deployment processing experience prepared me for future deployments.	Totally Disagree 1 2 3 4 5 Agree
61. I am confident in my ability to manage stress related to my primary job.	Totally Disagree 1 2 3 4 5 Agree
62. I am confident in my ability to manage stress related to my family.	Totally Disagree 1 2 3 4 5 Agree
63. I am confident in my ability to manage stress related to my finances.	Totally Disagree 1 2 3 4 5 Agree
64. I am confident I will be able to access emotional support while deployed.	Totally Disagree 1 2 3 4 5 Agree
65. I am confident I will know how to access mental health services if needed while deployed.	Totally Disagree 1 2 3 4 5 Agree
66. I am prepared to deal with death, dying, and carnage.	Totally Disagree 1 2 3 4 5 Agree
67. Exploring the possibility of my own death will make me more able to function in a deployed setting.	Totally Disagree 1 2 3 4 5 Agree
68. I am prepared to deal with battle stress.	Totally Disagree 1 2 3 4 5 Agree
69. I am prepared to deal with weather extremes.	Totally Disagree 1 2 3 4 5 Agree
	----- Go to next page -----

Appendix 2 (cont)  
Readiness Estimate and Deployability Index Revised for Air Force Nurses

<u>For the following, please indicate your level of agreement according to this scale by completely circling your response</u>	<u>Scale for Level of Agreement</u>
	1= Totally Disagree 2= Minimally Agree 3= Moderately Agree 4= Highly Agree 5= Totally Agree
70. I understand that work schedules in the deployed setting will involve long hours.	<b>Totally Disagree</b> 1   2   3   4   5 <b>Totally Agree</b>
71. I realize lack of privacy will be a fact of life in a deployed setting.	<b>Totally Disagree</b> 1   2   3   4   5 <b>Totally Agree</b>
72. When deployed, it is primarily my responsibility to identify and use my Chain of Command in my deployed unit.	<b>Totally Disagree</b> 1   2   3   4   5 <b>Totally Agree</b>
73. I understand military rules and regulations.	<b>Totally Disagree</b> 1   2   3   4   5 <b>Totally Agree</b>
74. I believe there is a real need for military rules and regulations, especially while on deployment.	<b>Totally Disagree</b> 1   2   3   4   5 <b>Totally Agree</b>
75. I think it is critical that the deployed commander put into practice the leadership principle: "Know your people and look out for their well-being".	<b>Totally Disagree</b> 1   2   3   4   5 <b>Totally Agree</b>
76. I think it is important for the deployed commander to be sure any training that takes place in the deployed setting is realistic, relevant and adheres to the highest standards.	<b>Totally Disagree</b> 1   2   3   4   5 <b>Totally Agree</b>
77. It is critical that my deployment commander keeps me informed of all pertinent information.	<b>Totally Disagree</b> 1   2   3   4   5 <b>Totally Agree</b>
78. I am prepared to deal with crowded and co-ed. sleeping quarters while deployed.	<b>Totally Disagree</b> 1   2   3   4   5 <b>Totally Agree</b>
79. I am satisfied I will be given sufficient deployment training before I am tasked for deployment with my unit.	<b>Totally Disagree</b> 1   2   3   4   5 <b>Totally Agree</b>
80. I am satisfied I will be given sufficient training on all pertinent deployment equipment prior to a deployment.	<b>Totally Disagree</b> 1   2   3   4   5 <b>Totally Agree</b>
	----- Go to next page-----

## Appendix 2 (cont)

## Readiness Estimate and Deployability Index Revised for Air Force Nurses

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81. Understanding my deployed unit's mission, vision, and values is critical to my ability to perform successfully.	<table><tr><td><b>Totally</b></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td><b>Totally</b></td></tr><tr><td><b>Disagree</b></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td></td><td></td><td><b>Agree</b></td></tr></table>	<b>Totally</b>								<b>Totally</b>	<b>Disagree</b>	1	2	3	4	5			<b>Agree</b>
<b>Totally</b>								<b>Totally</b>											
<b>Disagree</b>	1	2	3	4	5			<b>Agree</b>											
82. I am confident I will be able to function as a group leader in a deployed setting if needed.	<table><tr><td><b>Totally</b></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td><b>Totally</b></td></tr><tr><td><b>Disagree</b></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td></td><td></td><td><b>Agree</b></td></tr></table>	<b>Totally</b>								<b>Totally</b>	<b>Disagree</b>	1	2	3	4	5			<b>Agree</b>
<b>Totally</b>								<b>Totally</b>											
<b>Disagree</b>	1	2	3	4	5			<b>Agree</b>											
83. It is critical for me to have a successful working relationship with members in my deployment unit.	<table><tr><td><b>Totally</b></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td><b>Totally</b></td></tr><tr><td><b>Disagree</b></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td></td><td></td><td><b>Agree</b></td></tr></table>	<b>Totally</b>								<b>Totally</b>	<b>Disagree</b>	1	2	3	4	5			<b>Agree</b>
<b>Totally</b>								<b>Totally</b>											
<b>Disagree</b>	1	2	3	4	5			<b>Agree</b>											

**Please place an [X] or fill in the blank in each item below to indicate your response**

**Demographic Data**

1. What is your current component? (Check one)

☐ Active Duty

☐ Air National Guard

☐ Air Force Reserve

☐ Other \_\_\_\_\_

2. What is your primary AFSC? (Check one)

☐ 46A3Nursing Administrator

☐ 46P3 - Mental Health Nurse

☐ 46P3A Mental Health Nurse Specialist

☐ 46S3 - Operating Room Nurse

☐ 46M3 - Nurse Anesthesia

☐ 46N3 - Clinical Nurse

☐ 46N3A - OB/GYN Nurse Practitioner

☐ 46N3G- Obstetrics Nurse

☐ 46G3 - Nurse Midwife

☐ 46N3B - Pediatric Nurse Practitioner

☐ 46N3C - Primary Care Nurse Practitioner

☐ 46F3 Flight Nurse

☐ 46N3D Staff Development

☐ 46N3E - Critical Care Nurse

☐ 46N3F Neonatal ICU Clinical Nurse

☐ 46N3H - Family Nurse Practitioner

## Appendix 2 (cont)

## Readiness Estimate and Deployability Index Revised for Air Force Nurses

3. How many years of nursing experience do you have (include military and civilian experience) [in years and months]?

---

4. How many years of experience do you have in a specialized nursing position (list all specialties and years of experience) [in years and months] ?

---

---

5. To what major command are you assigned? (Check one)

☐ Air Combat Command

☐ Air Education and Training Command

☐ Air Mobility Command

☐ Air Force Materiel Command

☐ Air Force Space Command

☐ Air Force Special Operations Command ☐ Other \_\_\_\_\_

6. Do you have prior technical medical experience (i.e. medical technician)?

☐ yes ☐ no

7. Are you male or female?

☐ Male ☐ Female

8. What is your military rank?

☐ 01 2nd Lieutenant

☐ 02 1st Lieutenant

☐ 03 Captain

☐ 04 Major

☐ 05 Lieutenant Colonel

☐ 06 Colonel

9. What is your highest education level?

☐ BSN

☐ MSN

☐ Ph.D.

☐ Masters other than nursing

10. Do you have any special certifications (i.e. CCRN)? Please list

## Appendix 2 (cont)

## Readiness Estimate and Deployability Index Revised for Air Force Nurses

11. When was the last time you provided direct patient care? (Check one)

- ☐ More than 4 years ago  
☐ Within the most recent 1-4 years  
☐ Within the last year, but more than 6 months ago  
☐ Within the last 6 months

12. What type(s) of triage experiences and education have you had? (Check all that apply)

- ☐ I have not learned about triage yet  
☐ Learned through military or civilian courses  
☐ Learned through inservices, nursing courses, journals, handouts, etc.  
☐ Practiced triage in an ED setting  
☐ Practiced triage in a field environment on real and/or moulaged patients

13. Are you currently assigned to a mobility platform (i.e. Unit Type Code (UTC) such as Expeditionary Medical Support/Air Force Theater Hospital (AFTH) or Aeromedical Evacuation?

- ☐ yes ☐ no

4. What is your deployment status?

- ☐ I am deployed.  
☐ I am not deployed but will deploy within 90 days.  
☐ I am not assigned to a deployment platform

15. Have you ever deployed? (if No, proceed to question 19)

- ☐ Yes ☐ No

16. How many times have you deployed?

17. What was the average length of your deployment (longest, if more than one)?

- ☐ 2 weeks ☐ 90 days  
☐ 30 days ☐ 120 days  
☐ 60 days ☐ 179 days

18. How long ago were you deployed [in years and months] ?

years \_\_\_\_\_ months \_\_\_\_\_

19. If you have not deployed, have you discussed deployment experiences with those who have deployed?

- ☐ Yes ☐ No

20. If yes to question 19, indicate your overall feeling about deployment from this discussion:

- ☐ Caused me to feel more anxious about a deployment  
☐ Caused me to feel less anxious about a deployment  
☐ Didn't have any influence on how I feel about deployments

Appendix 2 (cont)  
Readiness Estimate and Deployability Index Revised for Air Force Nurses

21. How many times have you taken part in Combat Medical Readiness Training (CMRT)  
? \_\_\_\_\_
22. What is your age? (fill in blank) \_\_\_\_\_
23. How frequently do you exercise?  
☐ at least 3-5 times a week  
☐ twice a week  
☐ once a week  
☐ less often than once a week
24. Check the box that represents how long ago it was that you had a physical exam.  
☐ 1-12 months Ago  
☐ 1-5 years ago  
☐ longer than five years ago
25. Are you up to date on routine gender specific(i.e. mammogram for women/prostate for men), health related exams?  
☐ Yes ☐ No ☐ not sure
26. If indicated, do you have a family care plan to make arrangements for your children (required for single parents or if both parents are military)?  
☐ Yes ☐ No ☐ Not Applicable
27. If single, do you have a support plan for your pets, finances or elder dependents?  
☐ Yes ☐ No ☐ Not Applicable
28. Which of the following would you use to help you in coping with stress?  
(Check ALL that apply)  
☐ Tobacco  
☐ Physical Exercise  
☐ Relaxation/Meditation Techniques  
☐ Talking with Friends  
☐ Religious Faith  
☐ Eating  
☐ Sleeping ☐ Other \_\_\_\_\_

**You have completed the questionnaire. Thank you so much for  
taking part in this study and assisting us with the development of this instrument.**

## Appendix 3

# DABS

NAME \_\_\_\_\_ PATIENT NO.: \_\_\_\_\_ TECHNICIAN: \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ VISIT NO.: \_\_\_\_\_  
 AGE: \_\_\_\_\_ SEX: M \_ F \_ DATE: \_\_\_\_\_ REMARKS: \_\_\_\_\_

## INSTRUCTIONS

Below is a list of words that describes the way people sometimes feel. We would like you to tell us whether you have been having any of these feelings during the past \_\_\_\_\_ including today. Please indicate the degree to which you have felt each emotion by circling the number that best describes your experience. Circle only one number for each emotion and do not skip any items.

	NEVER	RARELY	SOMETIMES	FREQUENTLY	ALWAYS		NEVER	RARELY	SOMETIMES	FREQUENTLY	ALWAYS
1. NERVOUS	0	1	2	3	4	21. CHEERFUL	0	1	2	3	4
2. SAD	0	1	2	3	4	22. SATISFIED	0	1	2	3	4
3. REGRETFUL	0	1	2	3	4	23. ACTIVE	0	1	2	3	4
4. IRRITABLE	0	1	2	3	4	24. FRIENDLY	0	1	2	3	4
5. HAPPY	0	1	2	3	4	25. ANXIOUS	0	1	2	3	4
6. PLEASED	0	1	2	3	4	26. MISERABLE	0	1	2	3	4
7. EXCITED	0	1	2	3	4	27. GUILTY	0	1	2	3	4
8. PASSIONATE	0	1	2	3	4	28. ENRAGED	0	1	2	3	4
9. TIMID	0	1	2	3	4	29. DELIGHTED	0	1	2	3	4
10. HOPELESS	0	1	2	3	4	30. RELAXED	0	1	2	3	4
11. BLAMEWORTHY	0	1	2	3	4	31. VIGOROUS	0	1	2	3	4
12. RESENTFUL	0	1	2	3	4	32. AFFECTIONATE	0	1	2	3	4
13. GLAD	0	1	2	3	4	33. AFRAID	0	1	2	3	4
14. CALM	0	1	2	3	4	34. UNHAPPY	0	1	2	3	4
15. ENERGETIC	0	1	2	3	4	35. REMORSEFUL	0	1	2	3	4
16. LOVING	0	1	2	3	4	36. BITTER	0	1	2	3	4
17. TENSE	0	1	2	3	4	37. JOYOUS	0	1	2	3	4
18. WORTHLESS	0	1	2	3	4	38. CONTENTED	0	1	2	3	4
19. ASHAMED	0	1	2	3	4	39. LIVELY	0	1	2	3	4
20. ANGRY	0	1	2	3	4	40. WARM	0	1	2	3	4

## Appendix 4



# BSI<sup>®</sup> 18

## Brief Symptom Inventory 18

Leonard R. Derogatis, PhD

Name \_\_\_\_\_

ID Number \_\_\_\_\_ Date Tested \_\_\_\_\_

Gender \_\_\_\_\_ Age \_\_\_\_\_

Scored By \_\_\_\_\_

## INSTRUCTIONS:

Below is a list of problems people sometimes have. Read each one carefully and fill in the circle that best describes HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY. Blacken the circle for only one number for each problem. Do not skip any items. If you change your mind, erase your first mark carefully and then fill in your new choice. Read the example before beginning. If you have any questions, please ask them now.

	NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY	
1	0	1	2	3	4	Bodyaches

	NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY	HOW MUCH WERE YOU DISTRESSED BY:	1	2	3
1	0	1	2	3	4	Faintness or dizziness	1		
2	0	1	2	3	4	Feeling no interest in things		2	
3	0	1	2	3	4	Nervousness or shakiness inside			3
4	0	1	2	3	4	Pain in heart or chest	1		
5	0	1	2	3	4	Feeling lonely		2	
6	0	1	2	3	4	Feeling tense or keyed up			3
7	0	1	2	3	4	Nausea or upset stomach	1		
8	0	1	2	3	4	Feeling blue		2	
9	0	1	2	3	4	Suddenly scared for no reason			3
10	0	1	2	3	4	Trouble getting your breath	1		
11	0	1	2	3	4	Feelings of worthlessness		2	
12	0	1	2	3	4	Spells of terror or panic			3
13	0	1	2	3	4	Numbness or tingling in parts of your body	1		
14	0	1	2	3	4	Feeling hopeless about the future		2	
15	0	1	2	3	4	Feeling so restless you couldn't sit still			3
16	0	1	2	3	4	Feeling weak in parts of your body	1		
17	0	1	2	3	4	Thoughts of ending your life		2	
18	0	1	2	3	4	Feeling fearful			3

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A B C D



Product Number  
51907



## Appendix 5a

UNIVERSITY OF MARYLAND  
BALTIMORE  
INSTITUTIONAL REVIEW BOARD

655 W. Baltimore Street  
Room 14-016 BRB  
Baltimore, MD 21201-1339

email: [ORS@som.umaryland.edu](mailto:ORS@som.umaryland.edu)  
voice: (410) 706-5037  
Assurance Number: M1174-01NR

TO: RITA BRAUN, Ph.D. */LTC Theresa L. Collins*  
655 W. Lombard Street  
Room 445D

FROM: INSTITUTIONAL REVIEW BOARD

DATE: August 14, 2000

RE: IRB PROTOCOL #1299051 *Re: Proposal N00003*

"Readiness Instrument Psychometric Evaluation: Readiness Estimate & Deployability Index Revised) for Air Force Nurses (READI-R-AFN)"

Expires: 02/03/2003

Report required once yearly

Response to correspondence dated: 08/07/2000

This is to certify that the Institutional Review Board has approved your request for amendment(s). **Please note that the enclosed stamped consent form expires on the anniversary date of this protocol. The expiration date can be found on the last page of the consent form.**

*You must notify the IRB if the project is altered in any way (change in location, personnel, number of subjects, age of subjects, or any change in research protocol). If you have any questions, please do not hesitate to contact the Office for Research Subjects by email ([ORS@som.umaryland.edu](mailto:ORS@som.umaryland.edu)) or by phone (at 706-5037).*

  
William A. Blattner, M.D.  
Chairman, IRB

SCHOOL OF NURSING  
Academic Affairs

## Appendix 5b



OFFICE OF RESEARCH

## UNIVERSITY OF MARYLAND

**Research Consent Form**

**Project:** Readiness Instrument Psychometric Evaluation: Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN).

**Investigator:**

Rita Braun, PhD

**Phone:**

(410) 706-7786

**Co-Investigator:**

Theresa L. Collins

**Phone:**

(410) 706-2619

**Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Purpose of the Study:**

The purpose of this study is to identify how prepared nurses are for deployments. This study will contribute to development of an instrument that will serve as a diagnostic training tool for Air Force military world-wide medical readiness missions, or military deployments.

**Procedures:**

By taking part in this study, you will be contributing to the development of an instrument for self-assessment of how prepared you believe you are to take part in worldwide medical readiness missions, or military deployments. Your participation in this study will involve completing several brief forms to report your perceptions of your individual readiness on the Readiness Estimate and Deployability Index Revised for Air Force Nurses (READI-R-AFN) related to (a) clinical nursing competency, (b) operational competency, (c) soldier/ survival skills, (d) personal /psychological /physical readiness, (e) satisfaction with leadership and administrative support, and (f) group integration. In addition, two questionnaires designed to double check results on the READI-R-AFN are the Derogatis Affects Balance Scale (DABS) which evaluates mood balance and the Brief Symptom Inventory (BSI) which evaluates psychological distress. There are also basic demographic questions (e. g. age, years of nursing experience, gender, training, deployment status, type of military unit assigned). One week following the completion and return of the first questionnaires and consent form, you may be asked to complete and return the READI-R-AFN a second time.

**Risks/Discomfort:**

This project involves no physical risk or discomfort to you. Participation involves minimal risk, which is defined as not greater than those encountered in your daily life or in performance of your routine activities as a military member.

## Appendix 5c

**Benefits:**

There are no personal benefits to you for participating in this project. However, your participation will help us better appreciate the preparedness of nurses when required to prepare for deployments. Information gathered through these questionnaires may contribute to improvements in future deployment procedures.

**Cost/Compensation:**

There is no compensation for participation in this study.

**Confidentiality:**

You will remain anonymous by virtue of being assigned a randomly determined ID number, which will be the sole means of your identification in the study database. Your name will never appear on any study test forms, or electronically in the study database. No linkage between your name and study ID number will be maintained. All study forms will be maintained in a locked file cabinet. The Institutional Review Board of University of Maryland, Baltimore and the Uniformed Services University of the Health Sciences, Bethesda, MD, and other Federal agencies who provide oversight for human subject protection may see your records.

**Right to Withdraw:**

Participation in this study is voluntary. You are not obligated to participate in this research. You are free to withdraw your consent at anytime. You may refuse to answer any part of the questionnaire. Refusal to participate will not affect your current or future involvement with the University of Maryland at Baltimore.

**University Statement:**

The University of Maryland, Baltimore is committed to providing subjects of its research all rights due them under state and Federal law. You give up none of your legal rights by signing this consent form or by participating in this research project. Please call the Institutional Review Board (IRB) if you have questions about your rights as a research subject. The University of Maryland Institutional Review Board (IRB), a group of scientists, physicians, and other experts have classified the research described in this consent form as minimal risk. The Board's membership includes persons who are not affiliated with the University and persons who do not conduct research projects. The Board's decision that the research is minimal risk does not mean that the research is risk free, however, generally speaking, you are assuming the risk of research participation, as discussed in the consent form. But if you are harmed as a result of the negligence of a research, you can make a claim for compensation. If you believe you have been harmed through participation in this research study as a result of research negligence, you can contact the IRB for more information about claim procedures.

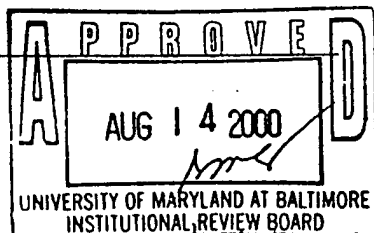


Institutional Review Board  
University of Maryland  
655 West Baltimore Street, #BRB-14-016  
Baltimore, Maryland 21201  
(410)706-5037

## Appendix 5d

If you agree to join this study, please sign your name below.

**NOT VALID WITHOUT THE  
IRB STAMP OF  
CERTIFICATION**



VALID FROM 8/14/00 TO 2/3/01

Subject's signature \_\_\_\_\_

\_\_\_\_ I have read and understand  
the information on this form

\_\_\_\_ I have had the information  
on this form explained to me.

Date: \_\_\_\_\_

Date: \_\_\_\_\_

RPN NO. 1299051

\_\_\_\_\_  
Witness to Consent procedures\*

\_\_\_\_\_  
Signature of Investigator

Date: \_\_\_\_\_

\*Optional unless subject is illiterate, or unable to sign.

NOTE: Copies of this Consent Form with original signatures must be a) retained on file by the Principal Investigator; and b) given to the subject. A copy must also be deposited in the patient's medical record ( if any).

---

Appendix 5c  
UNIVERSITY OF MARYLAND  
BALTIMORE  
INSTITUTIONAL REVIEW BOARD

655 W. Baltimore Street  
Room 14-016 BRB  
Baltimore, MD 21201-1559

email: [ORS@som.umaryland.edu](mailto:ORS@som.umaryland.edu)  
voice: (410) 706-5037  
Assurance Number: M1174-01NR

TO: RITA BRAUN, Ph.D.  
655 W. Lombard Street  
Room 445D

FROM: INSTITUTIONAL REVIEW BOARD

DATE: March 7, 2001

RE: IRB PROTOCOL #1299051

"Readiness Instrument Psychometric Evaluation: Readiness Estimate & Deployability Index Revised) for Air Force Nurses (READI-R-AFN)"

Expires: 2/3/02

Response to correspondence dated: February 25, 2001

This is to certify that the Institutional Review Board has approved your request for amendment(s) .

*You must notify the IRB if the project is altered in any way (change in location, personnel, number of subjects, age of subjects, or any change in research protocol). If you have any questions, please do not hesitate to contact the Office for Research Subjects by email ([ORS@som.umaryland.edu](mailto:ORS@som.umaryland.edu)) or by phone (at 706-5037).*



William A. Blattner, M.D.  
Chairman, IRB

## Appendix 5f

DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR FORCE MATERIEL COMMAND  
WRIGHT-PATTERSON AIR FORCE BASE OHIO



8 August 2000

## MEMORANDUM FOR THERESA COLLINS

FROM: 74<sup>TH</sup> MDOS/SGOA  
Clinical Investigations Office  
4881 Sugar Maple Drive  
Wright-Patterson AFB OH 45433-5529

SUBJECT: Clinical Investigation Protocol Amendment

1. The amendment dated 8/2/2000 for FWP20000003E, "Readiness Instrument Psychometric Evaluation: Readiness Estimate and Deployability Index (READI)," P.I. Lt Col Theresa Collins, was reviewed and approved via expedited review on 8/8/00.
2. If you have any questions, I can be reached at 74242.

A handwritten signature in cursive script, reading "Debbie Bachman", is positioned above the typed name.

DEBBIE BACHMAN  
Clinical Investigations Coordinator

## Appendix 5g

DEPARTMENT OF THE AIR FORCE  
60TH MEDICAL SUPPORT SQUADRON (AMC)

9 Aug 00

MEMORANDUM FOR Lt Col Theresa Collins  
1646 Angus Court  
Crofton, MD 21114

FROM: 60 MDSS/SGSEM  
101 Bodin Circle  
Travis AFB, CA 94535-1809

SUBJECT: Research Protocol IRB Approval, # FDG20000007H

1. The 60<sup>th</sup> Medical Group's Institutional Review Board approved your research protocol on 10 Jul 00 entitled "*Readiness Instrument Psychometric Evaluation: Readiness Estimate and Deployability Index (READI)*." The approval was pending changes to the confidentiality section of the informed consent document. These changes were made on 21 Jul 00.
2. The protocol is assigned protocol # FDG20000007H. Please refer to this number in all future correspondence regarding the study.

A handwritten signature in black ink, reading "Raymond S. Dougherty", is positioned above the printed name and title.

RAYMOND S. DOUGHERTY, Lt Col, USAF, MC  
Chairperson, Institutional Review Board

cc:  
Protocol File

## Appendix 5h

MEMORANDUM FOR: 59<sup>th</sup> CRES/MSRP (Research Protocol Office)

16 Aug 2000

FROM: Elizabeth Bridges, Lt Col, USAF, NC. 59CRES/MSR, DP 27142

SUBJECT: Amendment to Research

1. Protocol Number: FWH20000148E
2. Title: Readiness Instrument Psychometric Evaluation: Readiness Estimate and Deployability Index (READI)
3. Amendment Number: #1
4. Requested Change(s):

Phase I: Preliminary Validation: The original study was designed to perform the Phase I evaluation on a total of 50 nurses (active duty and reserve) Air Force wide. Scientific reviewers for the grant submitted to the TriService Nursing Research Program indicated there could be significant differences between the active duty and reserve nurses, and a pilot study should be accomplished with participants who are similar to those in the field validation study. In addition, the sample size of was considered to be insufficient to complete the appropriate statistical analysis. A sample of approximately 220 nurses is required for the factor analysis of the READI. Thirty nurses are also needed to participate in the test-retest analysis of the instrument. In order to meet the requirements specified by the reviewers the sampling needed to be expanded. Response rates to a mailed survey seldom exceed 20%. In order to ensure the desired sample size of ~220 Phase I will now be conducted solely at Wilford Hall. All active duty nurses assigned to Wilford Hall Medical Center (N = 445) will be asked to participate in the survey. The estimated response rate of 50% is based on results of previous survey research conducted at Wilford Hall.

Phase II: Full Field Validation: No aspects of Phase II will be conducted at Wilford Hall. Phase II will now be conducted at the three remaining Air Force bases identified in the initial proposal. A contact researcher at each base will assist with the initial contact of each convenience sample. 205 nurses are located at Travis AFB, California, 175 nurses at Andrews AFB, Maryland and 175 nurses at Wright-Patterson AFB, Ohio. A 50% response rate out of a sample of 555 nurses ~277, and therefore would be a sufficient number needed to yield an accurate estimate of true factors with factor analysis.

Phase III: Sensitivity: During Phase III, the revised version of the READI, the READI-SF will again be introduced into a planned field evaluation (N = 230) to evaluate its sensitivity to intervention induced change. The 230 nurses, who may potentially deploy as a 46N3, and who will be participating in a field simulation lab at Wilford Hall Medical Center will be invited to participate. The intervention is a study designed to evaluate the sustainment of wartime competencies for the USAF nurse, titled "Wartime Competencies for the USAF nurse: Training for Sustainment". Since an increase in readiness preparation is anticipated as being related to the intervention, sensitivity to the intervention is an important contribution to construct validation of the instrument. The READI will be introduced at baseline as part of the pilot study (Phase I), which will occur prior to the 46N3 nurses participating in the sustainment training program, and following the nurses participation in the simulation laboratory. The surveys will be coded to indicate the nurse's deployment AFSC to allow for comparison before and after the intervention. The administration of the READI survey will not interfere with the results of the Sustainment Training grant.

*EL-LL JB-8*  
 ELIZABETH J. BRIDGES, Lt Col USAF NC  
 Director, Nursing Research

## For Protocol Office Use Only:

☐ FAX ☐ Distro ☐ Hand  
 Who Signed? ☐ PI ☐ Co-PI ☐ Auth AI ☐ Agenda

Received on: *16 AUG 2000*Initials *JB-8*

1 of 1

## For Review Purposes Only:

Eligible for Expedite Review? ☒ Yes ☐ No Date: *17 Aug 2000* Signature: *[Signature]*  
 Exempt Amendment Form



Appendix 5i

Received: 28.Aug.00 01:44 PM From: 3019814093 To: 6037370070

Powered by eFax.com

Page: 2 of 2



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 89TH AIRLIFT WING (AMC)

28 Aug 00

MEMORANDUM FOR UNIVERSITY OF MARYLAND AT BALTIMORE  
ATTENTION: LT COL THERESA COLLINS

FROM: 89 MDG/SGH  
1050 West Perimeter Road  
Andrews AFB, MD 20762-6600

SUBJECT: Proposed Clinical Investigation Research Protocol--Human Minimal Risk

1. Your amendments to the protocol entitled "Medical Instrument Psychometric Evaluation: Readiness Estimate and Deployability Index for Air Force (READI-R-AF) Nurses was approved per expedited review on 28 Aug 00.
2. Please submit protocol to TSgt Huff, 89 MDG/SGATR; 1050 West Perimeter Road; Andrews AFB MD 20762. Please call 240-857-6062 or FAX 240-857-4093 or email [thule.huff@mgmc.af.mil](mailto:thule.huff@mgmc.af.mil) if you have any questions.
3. We wish you the best in your research efforts. Thank you for your cooperation with the above IRB regulations and for participation in research at the 89th Medical Group.

  
THULE HUFF, TSgt, USAF  
IRB Coordinator

## Appendix 5j



## UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES

4301 JONES BRIDGE ROAD  
BETHESDA, MARYLAND 20814-4799



TriService Nursing Research Program

September 26, 2000

Ms. Janet Simons  
Manager, Grants and Contracts  
University of Maryland, Baltimore  
515 West Lombard Street, 5<sup>th</sup> Floor  
Baltimore, MD 21201

RE: TriService Nursing Research Program Grant MDA-905-00-1-0006, "Readiness Instrument Psychometric Evaluation: Readiness Estimate and Deployability Index (READI)" (N00-003), Principal Investigator Lt Col Theresa Collins

Dear Ms. Simons:

The above referenced TriService Nursing Research Program grant has been approved to initiate work on the research at the remaining two performance sites. Documentation for the protection of human subjects from Malcolm Grow Medical Center and David Grant Medical Center have been received and approved by the Uniformed Services University of the Health Sciences (USUHS) Institutional Review Board. Please find enclosed a copy of the USUHS Institutional Review Board approval letter dated September 22, 2000 for your records.

If there are any questions or concerns, please feel free to contact Ms. Anne Reedy at (301) 650-0018 ext. 162.

DIEP DUONG, Lt Col, USAF, NC  
Director  
TriService Nursing Research Program

Enclosure:  
as stated

cc: Lieutenant Colonel Collins

## Appendix 5k



## UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES

4301 JONES BRIDGE ROAD  
BETHESDA, MARYLAND 20814-4799



September 22, 2000

## MEMORANDUM FOR LTC THERESA COLLINS, TRISERVICE NURSING RESEARCH PROGRAM

SUBJECT: IRB Approval of Protocol TSNRP (N00-003) for Human Subject Use

In accordance with DoD Directive 3216.2 dated 7 January 1983, USUHS accepts the review and approval by the Malcolm Grow Medical Center and David Grant Medical Center Institutional Review Boards (IRBs) for the research protocol entitled "*Readiness Instrument Psychometric Evaluation: Readiness Estimate and Deployability Index (READI)*" under your direction. It is requested that you provide this office with human subject use review updates from each of your performance sites at least annually.

The purpose of this study is to identify how prepared nurses are for deployments. This study will contribute to the development of an instrument that will serve as a diagnostic training tool for Air Force military world-wide medical readiness missions or military deployments. This study involves completing several brief questionnaires to obtain self-assessments of how prepared subjects believe they are to take part in worldwide medical readiness missions or military deployments. The IRB understands that all subjects will be assigned a random ID number which will not be linked to subject identifying information.

You are required to submit amendments to this protocol, changes to the consent form, adverse event reports, and other pertinent information relative to human subject use for this project to this office for review. It is your responsibility to maintain an accurate and accessible file of all consent forms of participating human subjects.

If you have any questions regarding human subject use, please call me at 301-295-3303.

Richard R. Levine, Ph.D.  
LTC, MS, USA  
Director, Research Programs and  
Executive Secretary, IRB

cc: Director, Research Administration

## Appendix 51

7 September 99

TO: MAJ Theresa Collins, USAF NC

SUBJECT: Permission to use and modify research instrument

1. Thank you for your written request to modify and use my instrument named "Readiness Estimate and Deployability Index (READI). The READI, which addresses six dimensions of individual readiness for deployment, was developed through a 3 year funded process of concept clarification and psychometric testing.
2. I am very pleased to grant you permission to use the instrument in doctoral study at The University of Maryland and in preparation for a grant application and all other scholarly endeavors. Your use of the instrument will further estimate its psychometric properties with varying samples and in different contexts. This may lead to item refinement and wider applicability in the Federal Medical Sector.
3. Best wishes for continued success.

Sincerely,



Carol Reineck, Ph.D.  
Colonel, U.S. Army

419 Dickman Rd.  
Fort Sam Houston, TX 78234-2601

Summary Table of Structural Equation Modeling Analysis of Measurement Model: Readiness Estimate and Deployability Index

Readiness Estimate and Deployability Index Revised for Air Force Nurses (40 Items retained to create READI-R-AFN Short Form [SF])		>2 sig							
Item on scale		cr	R2	Lambda	P-value	In/out			
<b>Clinical Competency Subscale (10 Items retained)</b>									
Clin1-Competent treating shock		9.11	.54*	.737*	.32	OUT			
Clin2-Competent as a nurse in a mass casualty		9.29	.57*	.754*	.21	IN			
Clin3-Documentation of a patient's condition on a field medical card		8.06	.41	.643	.15	OUT			
Clin4-Current field technology for clinical documentation		6.34	.25	.497	.05	OUT			
Clin5-Calculating an IV drip without a calculator		6.94	.30	.546	.28	OUT			
Clin6-Reconstituting medications, calculating dosages 7 administering IV medications		7.68	.37	.610	.58	OUT			
Clin7-Ability to assess patients without the presence of a physician		9.15	.55*	.742*	.42	OUT			
Clin8-Performance in emergency situations, such as in cardiac arrest		9.32	.57	.757	.34	IN			
Clin9-Using the concept of body surface area to calculate extent of patient's burns		8.27	.44	.662	.09	OUT			
Clin10-Principles involved in deciding which critically injured patient is seen first		9.99	.67*	.821*	.25	OUT			
Clin11-Performing ACLS without a doctor present		8.58	.47	.690	.24	OUT			
Clin12-Taking care of life threatening injuries		10.25	.71*	.846*	.18	IN			
Clin13-Providing nursing care to a multiple trauma patient		9.68	.63*	.791*	.19	IN			
Clin14-Caring for a patient with NBC injuries		8.72	.49	.702	.03	OUT			
Clin15-Caring for patients with ballistic missile injuries		9.42	.59*	.766*	.08	IN			
Clin16-Recognition of a patient with a tension pneumothorax		10.25	.72*	.846*	.23	IN			
Clin17-Performing fluid resuscitation of a burn patient		9.73	.63*	.796*	.12	IN			
Clin18-Performing resuscitation with blood products		9.07	.54*	.734*	.34	IN			
Clin19-In the use of the field ventilator (Impact 754)		6.57	.27	.515	.03	OUT			
Clin20-Performing airway management		9.15	.55*	.742*	.37	IN			
Clin21-Implementing the triage categories		9.82	.65*	.805*	.27	IN			
Clin22-Performing in a multi-disciplinary healthcare team		8.28	.44	.663	.45	OUT			
Clin23-Providing care to a non-English speaking patient		5.11	.16	.396	.09	OUT			
Clin24-Performing Mental Health nursing skills (care of a patient with PTSD)		4.45	.19	.343	.08	OUT			

## Appendix 6 (cont)

Summary Table of Structural Equation Modeling Analysis of Measurement Model: Readiness Estimate and Deployability Index

Readiness Estimate and Deployability Index Revised for Air Force Nurses (40 Items retained to create READI-R-AFN Short Form [SF])	>2 sig						
Item on scale	cr	R2	Lambda	P-value	In/out		
Clin25-In using field infection control	7.99	.41	.637	.15	OUT		
Clin26-Using Orthopedic nursing skills (care of a patient in traction)	7.88	.39	.627	.19	OUT		
Clin27-Using Neurologic nursing skills (care of a patient with head trauma)	7.88	.40	.635	.17	OUT		
Clin28-Performing a complete nursing assessment and interpreting findings	7.96	.44	.667	.37	OUT		
<b>Operational Competency Subscale (7 Items retained)</b>							
Op29-Performing EKG with suction cup electrodes	6.71	.241	.491	.07	OUT		
Op30-Operating portable suction apparatus	8.37	.35	.595	.48	OUT		
Op31-Following aeromedical evacuation procedures	11.87	.62*	.786*	.14	IN		
Op32-Understanding capacity of each Echelon/Level of Care	13.47	.741*	.861*	.14	IN		
Op33-Knowing Law of Armed Conflict violations	13.57	.749*	.865*	.17	IN		
Op34-Setting up Field Sanitation and Hygiene	11.51	.590*	.768*	.07	IN		
Op35-Setting up Deployable Medical Systems (DEPMEDS)	11.51	.52*	.720	.10	IN		
Op36-Dealing with the unexpected (providing patient care in a bomb shelter)	10.58	.702*	.838*	.15	IN		
Op37-Caring for patients injured by weapons of mass destruction (terrorist attacks)	12.96	.64*	.803*	.08	IN		
<b>Soldier Survival Skills Subscale (8 Items retained)</b>							
sss38-Supporting humanitarian assistance	11.72	.56*	.747*	.18	OUT		
sss39-Requirements to protect yourself and patients if called to do so	13.12	.65*	.806*	.18	IN		
sss40-Ability to perform nursing skills in the M40 mask and MOPP gear	12.75	.62*	.791*	.15	IN		
sss41-Decontamination procedures of a patient exposed to chemical or biologic agents	12.75	.67*	.816*	.06	IN		
sss42-Application of Laws of Armed Conflict in a deployed setting	14.97	.76*	.873*	.15	OUT		
sss43-Ability to perform medical specialty under adverse field conditions	12.25	.69*	.770*	.28	IN		
sss44-Ability to decontaminate yourself using standard decontamination equipment	14.78	.75*	.770*	.09	IN		
sss45-With status under the Geneva Convention	13.40	.67*	.817*	.29	IN		
sss46-With the use of field communications equipment	13.40	.54*	.732*	.05	IN		
sss47-Actions to take during warning alarms	11.39	.70*	.834*	.12	IN		
<b>Personal, Psychosocial, Physical Subscale ( 7 Items retained)</b>							
ppp48-Maintaining dental fitness by annual dental exams	6.04	.25	.500	.75	OUT		
ppp49-An ideal physical state with annual health exams is important to prevent disease	5.14	.17	.418	.67	OUT		
ppp50-Participating in 30 minutes of aerobic exercise at least 3 times/wk prevent illness	6.27	.27	.522	.69	OUT		

Summary Table of Structural Equation Modeling Analysis of Measurement Model: Readiness Estimate and Deployability

Readiness Estimate and Deployability Index Revised for Air Force Nurses (40 Items retained to create READI-R-AFN Short Form [SF])		>2 sig		Lambda		P-value		In/out	
Item on scale		cr	R2						
ppp51-It is important to keep family care plans up to date to avoid delays in deployment processing		7.03	.36		.598		.82		OUT
ppp52-It is important to complete all mobility requirements to maintain an ideal state of preparedness		6.98	.35		.593		.81		OUT
ppp53-Confident support system (family/friends) will meet all my psychosocial needs		8.04	.50*		.707*		.59		IN
Item on scale		cr	R2		Lambda		P-value		In/out
ppp54-Confident support system will maintain communication with me		7.82	.46*		.682*		.74		IN
ppp55-Confident support system will be cared for in my absence		6.80	.33		.575		.63		OUT
ppp56-Important to have my "Will" in order prior to deployment		7.34	.35		.590		.78		OUT
ppp57-Important to have legal power of attorney arranged to maintain preparedness		7.34	.40		.630		.75		OUT
ppp58-Important to have legal matters attended to prior to deployment		7.31	.41*		.641*		.79		OUT
ppp59-Mission success is enhanced by a good working relationship with my co-workers		7.44	.39		.627		.85		OUT
ppp60-Prior deployment experience and/or deployment processing prepared me for future deployments		4.16	.11		.332		.24		OUT
ppp61-Confident in my ability to manage stress related to my primary job		4.16	.43*		.656*		.46		IN
ppp62-Confident in my ability to manage stress related to my family		7.82	.47*		.683*		.49		IN
ppp63-Confident in my ability to manage stress related to my finances		7.93	.48*		.694*		.54		IN
ppp64-Confident I will be able to access emotional support while deployed		7.15	.37		.611		.47		IN
ppp65-Confident I will know how to access mental health services if needed		7.45	.41		.642*		.43		IN
ppp66-Prepared to deal with death, dying and carnage		6.65	.31		.560		.31		OUT
ppp67-Exploring possibility of own death will make me more able to function in a deployed setting		5.54	.21		.453		.24		OUT
ppp68-Prepared to deal with battle stress		5.54	.32		.563		.20		OUT
ppp69-Prepared to deal with weather extremes		6.40	.29		.535		.25		OUT
ppp70-Understand work schedules in the deployed setting will involve long hours		6.40	.33		.578		.63		OUT
ppp71-Realize lack of privacy will be a fact of life while deployed		6.84	.39		.625		.65		OUT
<b>Leadership &amp; Administrative Support Subscale (4 Items retained)</b>									
la72-Have responsibility to know and use Chain of Command when deployed		6.97	.30		.552		.62		OUT
la73-Understand military rules and regulations		6.95	.30		.550		.57		OUT
la74-Believe there is a need for military rules and regulations on deployment		8.26	.43		.656*		.76		IN

## Appendix 6 (cont)

Summary Table of Structural Equation Modeling Analysis of Measurement Model: Readiness Estimate and Deployability

Readiness Estimate and Deployability Index Revised for Air Force Nurses (40 Items retained to create READI-R-AFN Short Form [SF])					
Item on scale	>2 sig cr	R2	Lambda	P-value	In/out
la75-Deployment commander should practice principle "Know your people and look out for their wellbeing"	10.96	.74*	.863*	.87	IN
la76-Important deployment commander be sure training on deployment is realistic, relevant, with high standards	10.69	.80*	.895*	.85	IN
la77-Deployment commander must keep me informed of pertinent information	10.97	.50	.707*	.79	IN
<b>Group Integration &amp; Identification Subscale (4 Items retained)</b>					
gii78-Prepared to deal with crowded and co-ed sleeping quarters while deployed	2.56	.15	.387	.57	IN
gii79-Satisfied I will be given sufficient deployment training prior to deployment	2.88	.89@	.940	.19	OUT
gii80-Will be given sufficient training on pertinent equipment prior to deployment	2.88	.94 @	.968	.17	OUT
gii81-Understanding deployed unit's mission, vision & values is critical to performance	2.65	.21	.454	.45	IN
gii82-Confident I will be able to function as a group leader in a deployed setting	2.59	.17	.409	.39	IN
gii83-It is critical to have a good working relationship with members in my deployment unit	2.60	.05	.216	.74	IN

\*Significant items and were maintained; cr = critical ratio; @Violated Multicollinearity assumption and were discarded



## Appendix 7

Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form  
(READI-R-AFN [SF])

<p align="center"><u>Please rate your level of competency according to the following scale</u></p> <p>1=I would need theory, demonstration and supervised practice 2=I would need review and supervised practice 3=I would need some review and little supervision 4= I would need review only 5=I would need no review or supervision</p>	<p align="center"><u>Please completely circle the item to indicate your response</u></p> <p align="center"><u>Scale for competency</u></p> <p>1= Not Competent 2= Minimally Competent 3= Moderately Competent 4= Highly Competent 5= Totally Competent</p>
1. How competent are you in your role as a nurse in a mass casualty (MASCAL) situation?	<p align="center">Not Competent      1   2   3   4   5      Totally Competent</p>
2. How competent are you to perform in emergency situations, such as those of patients in cardiac arrest?	<p align="center">Not Competent      1   2   3   4   5      Totally Competent</p>
3. How competent are you taking care of life threatening injuries?	<p align="center">Not Competent      1   2   3   4   5      Totally Competent</p>
4. How competent are you in providing nursing care to a multiple trauma patient?	<p align="center">Not Competent      1   2   3   4   5      Totally Competent</p>
5. How competent are you in the care of patients with ballistic missile injuries?	<p align="center">Not Competent      1   2   3   4   5      Totally Competent</p>
6. How competent are you in recognition of a patient with a tension pneumothorax?	<p align="center">Not Competent      1   2   3   4   5      Totally Competent</p>
7. How competent are you in the fluid resuscitation of a burn patient?	<p align="center">Not Competent      1   2   3   4   5      Totally Competent</p>
8. How competent are you in performing resuscitation with blood products?	<p align="center">Not Competent      1   2   3   4   5      Totally Competent</p>
9. How competent are you with performing airway management?	<p align="center">Not Competent      1   2   3   4   5      Totally Competent</p>
10. How competent are you in implementing the triage categories?	<p align="center">Not Competent      1   2   3   4   5      Totally Competent</p>
11. How competent are you with evacuation of patients using aeromedical evacuation procedures?	<p align="center">Not Competent      1   2   3   4   5      Totally Competent</p>
12. How competent are you in understanding the capacities of each Level of Care, formerly called Echelons of Care?	<p align="center">Not Competent      1   2   3   4   5      Totally Competent</p>
13. How competent are you with knowing the Law of Armed Conflict (LOAC) violations that must be reported (i.e. ordered to protect patients with force)?	<p align="center">Not Competent      1   2   3   4   5      Totally Competent</p>

Appendix 7(cont)  
Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form  
(READI-R-AFN [SF])

<p><u>Please rate your level of competency according to the following scale</u></p> <p>1=I would need theory, demonstration and supervised practice 2=I would need review and supervised practice 3=I would need some review and little supervision 4= I would need review only 5=I would need no review or supervision</p>	<p><u>Please completely circle the item to indicate your response</u></p> <p><u>Scale for competency</u></p> <p>1= Not Competent 2= Minimally Competent 3= Moderately Competent 4= Highly Competent 5= Totally Competent</p>
14. How competent are you in setting up your area for Field Sanitation and Hygiene?	<p>Not Competent      1   2   3   4   5      Totally Competent</p>
15. How competent are you with your ability to carry out Deployable Medical Systems DEPMEDS Setup (i.e. setting up tents and equipment)?	<p>Not Competent      1   2   3   4   5      Totally Competent</p>
16. How competent are you in dealing with the unexpected (i.e. providing patient care in a bomb shelter if necessary)?	<p>Not Competent      1   2   3   4   5      Totally Competent</p>
17. How competent are you with the nursing care required for patients injured by weapons of mass destruction (i.e. weapons used by terrorists)?	<p>Not Competent      1   2   3   4   5      Totally Competent</p>
18. How competent are you with what is required of you to protect yourself and/or your patient(s) if called upon to do so?	<p>Not Competent      1   2   3   4   5      Totally Competent</p>
19. How competent are you in your ability to perform nursing skills while in the M40 mask and MOPP gear?	<p>Not Competent      1   2   3   4   5      Totally Competent</p>
20. How competent are you with decontamination procedures of a patient exposed to chemical or biologic agents?	<p>Not Competent      1   2   3   4   5      Totally Competent</p>
21. How competent are you in your ability to perform your primary military specialty under adverse and/or prolonged field conditions (i.e. limited staff to provide relief)?	<p>Not Competent      1   2   3   4   5      Totally Competent</p>
22. How competent are you in your ability to decontaminate yourself using standard personal decontamination equipment?	<p>Not Competent      1   2   3   4   5      Totally Competent</p>

Appendix 7(cont)  
 Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form  
 (READI-R-AFN [SF])

<p style="text-align: center;"><u>For the following, please indicate your level of agreement according to this scale</u>  <u>By completely circling your response</u></p>	<p style="text-align: center;"><u>Scale for Level of Agreement</u>            1= Totally Disagree            2= Minimally Agree            3= Moderately Agree            4= Highly Agree            5= Totally Agree</p>
23. How competent are you in knowing your status under the Geneva Convention?	<p style="text-align: center;">Not Competent    1    2    3    4    5    Totally Competent</p>
24. How competent are you with use of field communications equipment (i.e. field radio)?	<p style="text-align: center;">Not Competent    1    2    3    4    5    Totally Competent</p>
25. How competent are you with actions you must take during warning alarms?	<p style="text-align: center;">Not Competent    1    2    3    4    5    Totally Competent</p>
26. I have confidence that my support system (i.e. family, friends or family support group) will meet all of my psychosocial needs.	<p style="text-align: center;">Totally Disagree    1    2    3    4    5    Totally Agree</p>
27. If I am deployed, I have confidence that my support system (i.e. family, friends or family support group) will maintain communication with me.	<p style="text-align: center;">Totally Disagree    1    2    3    4    5    Totally Agree</p>
28. I am confident in my ability to manage stress related to my primary job.	<p style="text-align: center;">Totally Disagree    1    2    3    4    5    Totally Agree</p>
29. I am confident in my ability to manage stress related to my family.	<p style="text-align: center;">Totally Disagree    1    2    3    4    5    Totally Agree</p>
30. I am confident in my ability to manage stress related to my finances.	<p style="text-align: center;">Totally Disagree    1    2    3    4    5    Totally Agree</p>
31. I am confident I will know how to access mental health services if needed while deployed.	<p style="text-align: center;">Totally Disagree    1    2    3    4    5    Totally Agree</p>
32. I believe there is a real need for military rules and regulations to be adapted to the deployment setting.	<p style="text-align: center;">Totally Disagree    1    2    3    4    5    Totally Agree</p>
33. I think it is possible for the staff to compensate for a commander who does not put into practice the leadership principle: "Know your people and look out for their well-being".	<p style="text-align: center;">Totally Disagree    1    2    3    4    5    Totally Agree</p>

Appendix 7(cont)  
Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form  
(READI-R-AFN [SF])

<p style="text-align: center;"><u>For the following, please indicate your level of agreement according to this scale by completely circling your response</u></p>	<p style="text-align: center;"><u>Scale for Level of Agreement</u></p> <p>1= Totally Disagree 2= Minimally Agree 3= Moderately Agree 4= Highly Agree 5= Totally Agree</p>
	<p>34. I believe I could perform successfully in the deployed setting in the absence of realistic and relevant training.</p>
<p>36. If my deployment commander is unable to keep me informed of all pertinent information, I could still perform successfully.</p>	<p>Totally Disagree 1   2   3   4   5 Totally Agree</p>
<p>37. I am prepared to deal with crowded, co-ed, and mixed ranks sleeping quarters while deployed.</p>	<p>Totally Disagree 1   2   3   4   5 Totally Agree</p>
<p>38. Understanding my deployed unit's mission, vision, and values is critical to my ability to perform successfully.</p>	<p>Totally Disagree 1   2   3   4   5 Totally Agree</p>
<p>39. I am confident I will be able to function as a group leader in a deployed setting if needed.</p>	<p>Totally Disagree 1   2   3   4   5 Totally Agree</p>
<p>40. It is critical for me to have a successful working relationship with members in my deployment unit.</p>	<p>Totally Disagree 1   2   3   4   5 Totally Agree</p>

-Please place an [X] or fill in the blank in each item below to indicate your response

Demographic Data

1. What is your current component? (Check one)

☐ Active Duty

☐ Air National Guard

☐ Air Force Reserve

☐ Other \_\_\_\_\_

Appendix 7(cont)  
Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form  
(READI-R-AFN [SF])

2. What is your primary AFSC? (Check one)

- ☐ 46A3 Nursing Administrator
- ☐ 46P3 Mental Health Nurse
- ☐ 46P3A Mental Health Nurse Specialist
- ☐ 46S3 Operating Room Nurse
- ☐ 46M3 Nurse Anesthetist
- ☐ 46N3 Clinical Nurse
- ☐ 46N3A OB/GYN Nurse Practitioner
- ☐ 46N3G Obstetrics Nurse
- ☐ 46G3 Nurse Midwife
- ☐ 46N3B Pediatric Nurse Practitioner
- ☐ 46N3C Primary Care Nurse Practitioner
- ☐ 46F3 Flight Nurse
- ☐ 46N3D Staff Development Officer
- ☐ 46N3E Critical Care Nurse
- ☐ 46N3F Neonatal ICU Clinical Nurse
- ☐ 46N3H Family Nurse Practitioner

3. How many years of nursing experience do you have (include military and RN or LPN civilian experience) [in years and months]?

\_\_\_\_\_

4. Do you have prior technical medical experience (i.e. medical technician)?

- ☐ yes    ☐ no

5. Are you male or female?

- ☐ Male        ☐ Female

6. What is your military rank?

- ☐ 01 2nd Lieutenant
- ☐ 02 1st Lieutenant
- ☐ 03 Captain
- ☐ 04 Major
- ☐ 05 Lieutenant Colonel
- ☐ 06 Colonel

7. What is your highest education level?

- ☐ Bachelors in Nursing
- ☐ Bachelors other than nursing
- ☐ Masters in Nursing
- ☐ Masters other than nursing
- ☐ Doctorate in Nursing
- ☐ Doctorate other than nursing

## Appendix 7(cont)

Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form  
(READI-R-AFN [SF])

8. When was the last time you provided direct patient care? (Check one)
- ☐ More than 4 years ago  
☐ Within the most recent 1-4 years  
☐ Within the last year, but more than 6 months ago  
☐ Within the last 6 months
9. What type(s) of triage experiences and education have you had? (Check all that apply)
- ☐ I have not learned about triage yet  
☐ Learned through military or civilian courses  
☐ Learned through inservices, nursing courses, journals, handouts, etc.  
☐ Practiced triage in an Emergency Department setting  
☐ Practiced triage in a field environment on real and/or moulaged patients
10. Are you currently assigned to a mobility platform (i.e. Unit Type Code (UTC) such as Expeditionary Medical Support/Air Force Theater Hospital (AFTH) or Aeromedical Evacuation?
- ☐ yes    ☐ no
11. What is your deployment status?
- ☐ I am deployed.  
☐ I am not deployed but will deploy within 90 days.  
☐ I am not assigned to a deployment platform
12. Have you ever deployed? (if No, proceed to question 16)
- ☐ Yes ☐ No
13. How many times have you deployed? \_\_\_\_\_
14. What was the length of your deployment (longest, if more than one)?
- ☐ 2 weeks                      ☐ 90 days  
☐ 30 days                      ☐ 120 days  
☐ 60 days                      ☐ 179 days

---

Please place an [X] or fill in the blank in each item below to indicate your response

---

15. What were the dates of your most recent deployment (months and year)?  
From \_\_\_\_\_ To \_\_\_\_\_
16. What is your age? (fill in blank) \_\_\_\_\_

----- Go to next page-----

## Appendix 7(cont)

Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form  
(READI-R-AFN [SF])

17. How frequently do you exercise?

- ☐ at least 3-5 times a week  
☐ twice a week  
☐ once a week  
☐ less often than once a week

18. Check the box that represents how long ago it was that you had a physical exam.

- ☐ 1-12 months Ago  
☐ 1-5 years ago  
☐ longer than five years ago

19. Are you up to date on routine gender specific(i.e. mammogram for women/prostate for men), health related exams?

- ☐ Yes ☐ No ☐ not sure

20. If indicated, do you have a family care plan to make arrangements for your children (required for single parents or if both parents are military)?

- ☐ Yes ☐ No ☐ Not Applicable

21. If single, do you have a support plan for your pets, finances or elder dependents?

- ☐ Yes ☐ No ☐ Not Applicable

22. Which of the following would you use to help you in coping with stress?

(Check ALL that apply)

- |   |  |
|---|--|
| <input type="checkbox"/> Tobacco                          | <input type="checkbox"/> Alcohol         |
| <input type="checkbox"/> Physical Exercise                | <input type="checkbox"/> Reading         |
| <input type="checkbox"/> Relaxation/Meditation Techniques | <input type="checkbox"/> Music           |
| <input type="checkbox"/> Talking with Friends             | <input type="checkbox"/> Religious Faith |
| <input type="checkbox"/> Eating                           | <input type="checkbox"/> Sleeping        |
| <input type="checkbox"/> Other _____                      |  |

You have completed the questionnaire. Thank you so much for taking part in this study and assisting us with the development of this instrument.

## Appendix 8

Item means, SDs, and Bivariate Correlations with READI-R-AFN SubScales (n=181)

Item	Mean	SD	CLIN	OP	SSS	PPP	LA	GII
CLIN1	3.93	.92	.72*	.49*	.39*	.27*	.23	.21
#CLIN2	3.39	1.16	.76*	.73*	.60*	.37*	.31*	.33*
CLIN3	3.23	1.23	.67*	.72*	.65*	.34*	.28*	.27*
CLIN4	2.46	1.17	.53*	.46*	.48*	.22	.21	.31*
CLIN5	3.82	1.00	.56*	.47*	.44*	.22	.19	.22
CLIN6	4.39	.82	.60*	.40*	.35*	.23	.18	.21
CLIN7	4.09	.96	.75*	.55*	.44*	.23	.23	.21
#CLIN8	3.94	1.02	.75*	.52*	.44*	.24	.18	.22
CLIN9	3.18	1.11	.68*	.60*	.57*	.30*	.27*	.31*
CLIN10	3.70	1.04	.81*	.65*	.56*	.36*	.35*	.23
CLIN11	3.43	1.29	.73*	.44*	.39*	.27*	.28*	.24
#CLIN12	3.45	1.03	.83*	.62*	.51*	.29*	.28*	.20
#CLIN13	3.39	1.13	.78*	.53*	.44*	.29*	.25	.20
CLIN14	2.55	1.05	.71*	.70*	.65*	.31*	.27*	.28*
#CLIN15	2.58	1.26	.79*	.73*	.64*	.30*	.23	.16
#CLIN16	3.49	1.17	.82*	.66*	.55*	.33*	.30*	.24
#CLIN17	3.02	1.18	.81*	.67*	.58*	.31*	.24	.25
#CLIN18	3.77	1.17	.71*	.53*	.43*	.27*	.17	.15
CLIN19	2.00	1.17	.54*	.46*	.39*	.09	.08	.16
#CLIN20	3.87	1.10	.73*	.54*	.47*	.25	.32*	.19
#CLIN21	3.61	1.17	.81*	.77*	.70*	.42*	.37*	.32*
Item	Mean	SD	CLIN	OP	SSS	PPP	LA	GII
CLIN22	4.15	.96	.67*	.58*	.55*	.41*	.34*	.30*

CLIN = Clinical Competency; OP = Operational Competency; SSS = Soldier Survival Skills; PPP = Personal/ Psychosocial/Physical Preparation; LA = Leadership & Administrative Support; GII = Group Integration & identification; #Items retained for Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form (READI-R-AFN [SF]). @ Items reworded to improve item in scale. \*Significant at  $p < .001$ .



Appendix 8 (cont)  
Item means, SDs, and Bivariate Correlations with READI-R-AFN SubScales (n=181)

Item	Mean	SD	CLIN	OP	SSS	PPP	LA	GII
CLIN24	2.86	1.14	.43*	.41*	.41*	.33*	.24	.23
CLIN25	3.35	1.10	.66*	.61*	.57*	.31*	.30*	.29*
CLIN26	3.34	1.15	.65*	.60*	.51*	.26*	.25	.23
CLIN27	3.39	1.10	.66*	.53*	.46*	.22	.22	.23
CLIN28	4.08	.90	.67*	.50*	.41*	.29*	.21	.23
OP29	2.75	1.35	.56*	.60*	.39*	.15	.16	.20
OP30	4.05	1.15	.70*	.67*	.48*	.22	.19	.18
#OP31	2.97	1.25	.60*	.80*	.67*	.25	.27*	.16
#OP32	3.27	1.21	.71*	.86*	.74*	.36*	.31*	.31*
#OP33	3.32	1.21	.67*	.85*	.81*	.33*	.31*	.26*
#OP34	2.88	1.18	.58*	.78*	.73*	.34*	.27*	.22*
#OP35	2.99	1.14	.53*	.73*	.73*	.27*	.25	.26
#OP36	3.22	1.17	.69*	.85*	.78*	.30*	.21	.18
#OP37	2.76	1.18	.71*	.84*	.72*	.40*	.25	.21
SSS38	3.28	1.17	.66*	.78*	.78*	.41*	.25	.27*
#SSS39	3.49	1.09	.64*	.76*	.82*	.48*	.35*	.39*
#SSS40	3.08	1.21	.62*	.67*	.82*	.30*	.27*	.26*
#SSS41	2.75	1.12	.60	.69*	.82*	.36*	.38*	.35*
SSS42	3.14	1.24	.63*	.78*	.89*	.44*	.29*	.31*
#SSS43	3.64	1.14	.62*	.71*	.78*	.42*	.30*	.26*
#SSS44	3.06	1.12	.58*	.71*	.86*	.35*	.36*	.27*
#SSS45	3.71	1.11	.61*	.71*	.81*	.48*	.39*	.32*
#SSS46	2.67	1.21	.46*	.56*	.76*	.30*	.30*	.28*
#SSS47	3.34	1.07	.54*	.70*	.84*	.34*	.35*	.34*

CLIN = Clinical Competency; OP = Operational Competency; SSS = Soldier Survival Skills; PPP = Personal/ Psychosocial/Physical Preparation; LA = Leadership & Administrative Support; GII = Group Integration & identification; #Items retained for Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form (READI-R-AFN [SF]). @ Items reworded to improve item in scale. \*Significant at  $p < .001$ .

Appendix 8 (cont)  
Item means, SDs, and Bivariate Correlations with READI-R-AFN SubScales (n=181)

Item	Mean	SD	CLIN	OP	SSS	PPP	LA	GII
PPP48	4.66	.69	.10	.04	.04	.34*	.25	.23
PPP49	4.50	.88	-.05	-.10	-.08	.40*	.20	.34*
PPP50	4.61	.68	.15	.07	.10	.43*	.27*	.28*
PPP51	4.78	.57	.15	.07	.12	.37*	.40*	.28*
PPP52	4.75	.61	.13	.07	.09	.38*	.40*	.25
PPP53	4.38	.88	.28	.26*	.30*	.66*	.39*	.49*
#PPP54	4.60	.78	.31*	.22	.22	.52*	.42*	.38*
PPP55	4.43	.89	.19	.14	.15	.60*	.36*	.44*
PPP56	4.67	.72	.14	.15	.17	.42*	.43*	.25
PPP57	4.67	.68	.07	.06	.11	.45*	.39*	.32*
PPP58	4.71	.66	.07	.04	.10	.47*	.44*	.32*
PPP59	4.81	.56	.18	.05	.07	.40*	.34*	.28*
PPP60 – no answer by 4 subjects 2.2%	3.39	1.29	.32*	.40*	.42*	.52*	.29*	.44*
#PPP61	4.24	.85	.38*	.32*	.43*	.73*	.42*	.42*
#PPP62	4.30	.83	.32*	.26*	.33*	.72*	.44*	.43*
#PPP63	4.39	.76	.33*	.30*	.40*	.71*	.46*	.44*
#PPP64	4.19	.92	.25	.22	.31*	.74*	.33*	.45*
#PPP65	4.14	.93	.28*	.27*	.35*	.78*	.45*	.44*
PPP66	3.78	1.12	.36*	.33*	.38*	.70*	.35*	.38*
PPP67	3.56	1.14	.10	.13	.18	.63*	.29*	.34*
PPP68	3.49	1.11	.32*	.34*	.41*	.76*	.33*	.41*
PPP69	3.65	1.08	.38*	.39*	.44*	.67*	.41*	.40*

CLIN =Clinical Competency; OP = Operational Competency; SSS = Soldier Survival Skills; PPP = Personal/ Psychosocial/Physical Preparation; LA = Leadership & Administrative Support; GII = Group Integration & identification; #Items retained for Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form (READI-R-AFN [SF]). @ Items reworded to improve item in scale. \*Significant at  $p < .001$ .

Appendix 8 (cont)  
Item means, SDs, and Bivariate Correlations with READI-R-AFN SubScales (n=181)

Item	Mean	SD	CLIN	OP	SSS	PPP	LA	GII
PPP70	4.54	.70	.40*	.35*	.38*	.52*	.57*	.29*
PPP71	4.56	.69	.43*	.36*	.37*	.55*	.62*	.35*
LA72	4.51	.75	.35*	.24	.30*	.49*	.81*	.44*
LA73	4.45	.70	.40*	.41*	.43*	.55*	.81*	.40*
#LA74@	4.70	.62	.33*	.28*	.36*	.50*	.72*	.36*
#LA75@	4.83	.50	.18	.14	.19	.29*	.54*	.28*
#LA76@	4.83	.48	.19	.11	.18	.33	.57*	.33*
#LA77@	4.72	.64	.09	.05	.14	.30*	.61*	.35*
#GII78@	4.33	.93	.32*	.27*	.35*	.56*	.46*	.67*
GII79@	3.31	1.11	.21	.18	.26*	.43*	.34*	.83*
GII80@	3.27	1.09	.19	.17	.21	.39*	.34*	.85*
#GII81@	4.18	.93	.07	-.005	.08	.41*	.35*	.67*
#GII82@	4.09	.96	.46*	.41*	.43*	.55*	.49*	.67*
#GII83@	4.68	.61	.25	.16	.19	.40*	.37*	.45*
CLIN	95.29	31.19	1.00	.82*	.72*	.40*	.35*	.34*
OP	28.20	8.40	.82*	1.00	.85*	.37*	.31*	.28*
SSS	32.14	9.49	.72*	.85*	1.00	.46*	.39*	.36*
Item	Mean	SD	CLIN	OP	SSS	PPP	LA	GII
PPP	103.82	12.06	.40*	.37*	.46*	1.00	.59*	.62*
LA	28.03	2.86	.35*	.31*	.39*	.59*	1.00	.52*
GII	23.86	4.01	.34*	.28*	.36*	.62*	.52*	1.00

CLIN =Clinical Competency; OP = Operational Competency; SSS = Soldier Survival Skills; PPP = Personal/ Psychosocial/Physical Preparation; LA = Leadership & Administrative Support; GII = Group Integration & identification; #Items retained for Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form (READI-R-AFN [SF]). @ Items reworded to improve item in scale. \*Significant at  $p < .001$ .

Item Frequencies and Percent Response of READI-R-AFN Scales (n=181)

Item	NC	NC	MC	MC	Md C	Md C	HC	HC	TC	TC
f= Freq / %=Percent	f	%	f	%	f	%	f	%	f	%
Clin1-Treat shock	0	0	11	6.1	49	27.1	62	34.3	59	32.6
*Clin2 - Mass casualty	11	6.1	29	16	57	31.5	46	25.4	38	21
Clin3 - Document field card	22	12.2	26	14.4	50	27.6	55	30.4	28	15.5
Clin4 - Field technology	48	26.5	46	25.4	52	28.7	26	14.4	9	5
Clin5 - Calculate IV drip	1	.6	23	12.7	33	18.2	74	40.9	50	27.6
Clin6 - Reconstitute meds	0	0	5	2.8	24	13.3	47	26	105	58
Clin7 - Assess patient on own	1	.6	11	6.1	36	19.9	55	30.4	78	43.1
*Clin8 - Perform in emergency	3	1.7	16	8.8	32	17.7	67	37	63	34.8
Clin9 - Calculate burn injuries	16	8.8	33	18.2	52	28.7	63	34.8	17	9.4
Clin10 - Prioritize patients	3	1.7	22	12.2	49	27.1	60	33.1	47	26
Clin11 - Do ACLS if no doctor	21	11.6	21	11.6	43	23.8	52	28.7	44	24.3
*Clin12 - Injuries threaten life	5	2.8	25	13.8	68	37.6	50	27.6	33	18.2
*Clin13 - Multiple trauma care	11	6.1	25	13.8	63	34.8	46	25.4	36	19.9
Clin14 - Care of NBC injuries	32	17.7	53	29.3	66	36.5	24	13.3	6	3.3
*Clin15 - Care of patient with ballistic missile injuries	44	24.3	49	27.1	42	23.2	31	17.1	15	8.3
*Clin16 - Tension pneumo	9	5	31	17.1	45	24.9	54	29.8	42	23.2
*Clin17 - Fluid replace of burn	16	8.8	52	28.7	48	26.5	42	23.2	23	12.7
*Clin18 - Administer blood	8	4.4	21	11.6	37	20.4	53	29.3	62	34.3
Clin19 - Use of field vent	83	45.9	50	27.6	19	10.5	23	12.7	6	3.3
*Clin20 - Airway management	3	1.7	22	12.2	37	20.4	52	28.7	67	37
*Clin21 - Implement triage	10	5.5	23	12.7	44	24.3	55	30.4	49	27.1

CLIN =Clinical Competency; OP = Operational Competency; SSS = Soldier Survival Skills; PPP = Personal/Psychosocial/Physical Preparation; LA = Leadership & Administrative Support; GII = Group Integration & Identification; NC = Not Competent; MC = Minimally Competent; MdC = Moderately Competent; HC = Highly Competent; TC = Totally Competent; TD = Totally Disagree; MD = Minimally Disagree; MdA = Moderately Agree; HA = Highly Agree; TA = Totally Agree.  
 \*Items retained for Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form (READI-R-AFN [SF]). @ Items reworded to improve item in scale.

Item Frequencies and Percent Response of READI-R-AFN Scales (n=181)

Item	NC	NC	MC	MC	Md C	Md C	HC	HC	TC	TC
f= Freq / %=Percent	f	%	f	%	f	%	f	%	f	%
Clin22 - Be on healthcare team	3	1.7	7	3.9	33	18.2	55	30.4	83	45.9
Clin23 - care of Non-English speaking patients	25	13.8	52	28.7	51	28.2	36	19.9	17	9.4
Clin24 - Patient with PTSD	22	12.2	50	27.6	56	30.9	38	21	15	8.3
Clin25 - Field infection control	11	6.1	29	16	53	29.3	61	33.7	27	14.9
Clin26 - Orthopedic skills	9	5	37	20.4	52	28.7	49	27.1	34	18.8
Clin27 - Head trauma	8	4.4	33	18.2	51	28.2	59	32.6	30	16.6
Clin28 - Assess & interpret	1	.6	9	5	33	18.2	70	38.7	68	37.6
Op29 - Perform suction EKG	41	22.7	44	24.3	39	21.5	33	18.2	24	13.3
Op30 - Portable suction	7	3.9	15	8.3	27	14.9	45	24.9	87	48.1
*Op31 - Air evacuation skills	26	14.4	40	22.1	54	29.8	36	19.9	25	13.8
*Op32 - Echelons of care	19	10.5	31	17.1	40	22.1	65	35.9	26	14.4
*Op33 - Law of Armed conflict	16	8.8	32	17.7	42	23.2	60	33.1	31	17.1
*Op34 - Field sanitation set up	26	14.4	44	24.3	50	27.6	47	26	14	7.7
*Op35 - Set up Deployable unit	18	9.9	46	25.4	56	30.9	42	23.2	19	10.5
*Op36 - Deal with unexpected	13	7.2	41	22.7	47	26	53	29.3	27	14.9
*Op37 - Terrorist weapons	28	15.5	54	29.8	47	26	38	21	14	7.7
SSS38 - Humanitarian assist	13	7.2	33	18.2	58	32	44	24.3	33	18.2
*SSS39 - Protect self & patient	10	5.5	22	12.2	52	28.7	64	35.4	33	18.2
*SSS40 - Perform in M40 gear	18	9.9	44	24.3	52	28.7	40	22.1	27	14.9
*SSS41 - Care of patient with chemical or biologic injuries	27	14.9	50	27.6	56	30.9	37	20.4	11	6.1

CLIN =Clinical Competency; OP = Operational Competency; SSS = Soldier Survival Skills; PPP = Personal/Psychosocial/Physical Preparation; LA = Leadership & Administrative Support; GI = Group Integration & Identification; NC = Not Competent; MC = Minimally Competent; MdC = Moderately Competent; HC = Highly Competent; TC = Totally Competent; TD = Totally Disagree; MD = Minimally Disagree; MdA = Moderately Agree; HA = Highly Agree; TA = Totally Agree.  
 \*Items retained for Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form (READI-R-AFN [SF]). @ Items reworded to improve item in scale.

Item Frequencies and Percent Response of READI-R-AFN Scales (n=181)

Item	NC	NC	MC	MC	Md C	Md C	HC	HC	TC	TC
f= Freq / %=Percent	f	%	f	%	f	%	f	%	f	%
SSS42 - Apply Law of Armed Conflict (LOAC) rules	23	12.7	32	17.7	50	27.6	49	27.1	27	14.9
*SSS43 - Skill in field setting	7	3.9	24	13.3	47	26	53	29.3	50	27.6
*SSS44 - Decontaminate self	19	10.5	35	19.3	61	33.7	49	27.1	17	9.4
*SSS45 - Geneva Convention	7	3.9	20	11	43	23.8	59	32.6	52	28.7
*SSS46 - Field communication	42	23.2	36	19.9	53	29.3	40	22.1	10	5.5
*SSS47 - Warning alarms act.	9	5	33	18.2	49	27.1	68	37.6	22	12.2
Item	TD	TD	MD	MD	MdA	Md	HA	HA	TA	TA
f= Freq / %=Percent	f	%	f	%	f	%	f	%	f	%
PPP48 - Dental fitness	2	1.1	1	.6	8	4.4	35	19.3	135	74.6
PPP49 - Annual health exams	4	2.2	5	2.8	8	4.4	43	23.8	121	66.9
PPP50 - Aerobic exercise	1	.6	3	1.7	5	2.8	47	26	125	69.1
PPP51 - Family care plans ok	2	1.1	0	0	2	1.1	28	15.5	149	82.3
PPP52 - Mobility requirements	2	1.1	1	.6	2	1.1	30	16.6	146	80.7
*PPP53 - Family meet needs	2	1.12	6	3.3	19	10.5	48	26.5	106	58.6
*PPP54 - Support be in contact	2	1.1	3	1.7	12	6.6	31	17.1	133	73.5
PPP55 - Support cared for	2	1.1	8	4.4	13	7.2	45	24.9	113	62.4
PPP56 - My 'Will' in order	2	1.1	2	1.1	9	5.0	27	14.9	141	77.9
PPP57 - Legal power of attny	2	1.1	0	0	9	5.0	34	18.8	136	75.1
PPP58 - Legal matters in order	2	1.1	1	.6	6	3.3	29	16.0	143	79.0
PPP59 - Good work relations	2	1.1	0	0	2	1.1	23	12.7	154	85.1
PPP60 - no answer by 4 subjects 2.2% - Prior deployment experience	13	7.2	21	11.6	57	31.5	42	23.2	44	24.3

CLIN = Clinical Competency; OP = Operational Competency; SSS = Soldier Survival Skills; PPP = Personal/Psychosocial/Physical Preparation; LA = Leadership & Administrative Support; GII = Group Integration & Identification; NC = Not Competent; MC = Minimally Competent; MdC = Moderately Competent; HC = Highly Competent; TC = Totally Competent; TD = Totally Disagree; MD = Minimally Disagree; MdA = Moderately Agree; HA = Highly Agree; TA = Totally Agree.  
 \*Items retained for Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form (READI-R-AFN [SF]). @ Items reworded to improve item in scale.

## Item Frequencies and Percent Response of READI-R-AFN Scales (n=181)

Item	TD	TD	MD	MD	MdA	Md	HA	HA	TA	TA
f= Freq / %=Percent	f	%	f	%	f	%	f	%	f	%
*PPP61- Manage stress of job	2	1.1	3	1.7	27	14.9	66	36.5	83	45.9
*PPP62 - Stress with family	1	.6	5	2.8	22	12.2	64	35.4	89	49.2
*PPP63 - Stress of finances	1	.6	2	1.1	19	10.5	62	34.3	97	53.6
*PPP64 - Emotional support ok	2	1.1	7	3.9	29	16.0	59	32.6	84	46.4
*PPP65 - Access to Psyche care	2	1.1	9	5.0	28	15.5	64	35.4	78	43.1
Item	TD	TD	MD	MD	MdA	Md	HA	HA	TA	TA
f= Freq / %=Percent	f	%	f	%	f	%	f	%	f	%
PPP66 - Prepared to deal with death, dying and carnage	7	3.9	20	11.0	36	19.9	61	33.7	57	31.5
PPP67 - Explore possibility of own death to better function	10	5.5	20	11.0	54	29.8	52	28.7	45	24.9
PPP68 - Deal with battle stress	10	5.5	23	12.7	52	28.7	60	33.1	36	19.9
PPP69 - Weather extremes	6	3.3	22	12.2	47	26.0	61	33.7	45	24.9
PPP70 - Work long hours while deployed	1	.6	0	0	15	8.3	50	27.6	115	63.5
PPP71 - Lack of privacy	1	.6	1	.6	12	6.6	49	27.1	118	65.2
LA72 - Chain of Command	2	1.1	1	.6	13	7.2	52	28.7	113	62.4
LA73 - Understand Military rules & regulations	0	0	2	1.1	16	8.8	61	33.7	102	56.4
*LA74@ - Need for rules & regulations on deployment	1	.6	1	.6	7	3.9	34	18.8	138	76.2
*LA75@ - Commander should look out for wellbeing of people	1	.6	0	0	4	2.2	19	10.5	157	86.7
*LA76@ - Training realistic	1	.6	0	0	2	1.1	23	12.7	155	85.6
*LA77@ - Keep me informed	2	1.1	0	0	7	3.9	29	16.0	143	79.0
*GII78@ - Crowded sleeping	3	1.7	6	3.3	22	12.2	48	26.5	102	56.4
GII79@ - Deployment training sufficient	7	3.9	36	19.9	65	35.9	39	21.5	34	18.8
GII80@ - Training on equipment prior to deployment	6	3.3	41	22.7	62	34.3	42	23.2	30	16.6
*GII81@ - Understanding Mission, vision, values is important for performance	2	1.1	8	4.4	28	15.5	61	33.7	82	45.3
*GII82@ - Will be able to function as a leader if needed	5	2.8	4	2.2	33	18.2	67	37.0	72	39.8
*GII83@ - Critical to have a good working relationship with members in deployment unit	1	.6	0	0	8	4.4	38	21.0	134	74.0

CLIN =Clinical Competency; OP = Operational Competency; SSS = Soldier Survival Skills; PPP = Personal/Psychosocial/hysical Preparation; LA = Leadership & Administrative Support; GII = Group Integration & Identification; NC = Not Competent; MC = Minimally Competent; MdC = Moderately Competent; HC = Highly Competent; TC = Totally Competent; TD = Totally Disagree; MD = Minimally Disagree; MdA = Moderately Agree; HA = Highly Agree; TA = Totally Agree.  
 \*Items retained for Readiness Estimate and Deployability Index Revised for Air Force Nurses Short Form (READI-R-AFN [SF]). @ Items reworded to improve item in scale.

## Appendix 10

Item Frequencies and Percent Response of READI-R-AFN [SF] Scales (n=205)

Item f= Freq / %=Percent	NC f	NC %	MC f	MC %	Md C f	Md C %	HC f	HC %	TC f	TC %
SF1Clin2 - Mass casualty	2	1.0	31	15.1	71	34.6	71	34.6	30	14.6
SF2Clin8 - Perform in emergency	1	.5	13	6.3	48	23.4	80	39.	63	30.7
SF3Clin12 - Injuries threaten life	2	1	21	10.2	70	34.1	70	34.1	41	20.5
SF4Clin13 - Multiple trauma care	4	2	43	21	68	33.2	54	26.3	36	17.6
SF5Clin15 - Care of patient with ballistic missile injuries	44	21.5	70	34.1	41	20	36	17.6	14	6.8
SF6Clin16 - Tension pneumo	2	1	31	15.1	68	33.2	62	30.2	42	20.5
SF7Clin17 - Fluid replace of burn	8	3.9	50	24.4	75	36.6	47	22.9	25	12.2
SF8Clin18 - Administer blood	4	2	21	10.2	49	23.9	64	31.2	66	32.7
SF9Clin20 - Airway management	1	.5	17	8.3	41	20	72	35.1	74	36.1
SF10Clin21 - Implement triage	4	2	14	6.8	60	29.3	75	36.6	52	25.4
SF11Op31 - Air evacuation skills	18	8.8	60	29.3	56	27.3	37	18	34	16.6
SF12Op32 - Echelons of care	13	6.3	31	15.1	64	31.2	69	33.7	28	13.7
SF13Op33 - Law of Armed conflict	12	5.9	42	20.5	60	29.3	65	31.7	26	12.7
SF14Op34 - Field sanitation set up	22	10.7	58	28.3	77	37.6	34	16.6	14	6.8
SF15Op35 - Set up Deployable unit	14	6.8	54	26.3	68	33.2	53	25.9	16	7.8
SF16Op36 - Deal with unexpected	10	4.9	33	16.1	70	34.1	67	32.7	25	12.2
SF17Op37 - Terrorist weapons	26	12.7	58	28.3	64	31.2	47	22.9	10	4.9
SF18SSS39 - Protect self & patient	4	2	42	20.5	61	29.8	65	31.7	33	16.1
SF19SSS40 - Perform in M40 gear	9	4.4	62	30.2	62	30.2	51	24.9	21	10.2
SF20SSS41 - Care of patient with chemical or biologic injuries	16	7.8	61	29.8	77	37.6	43	21	8	3.9
SF20SSS41 - Care of patient with chemical or biologic injuries	16	7.8	61	29.8	77	37.6	43	21	8	3.9
SF21SSS43 - Skill in field setting	3	1.5	32	15.6	61	29.8	63	30.7	46	22.4
SF22SSS44 - Decontaminate self	8	3.9	46	22.4	68	33.2	67	32.7	16	7.8
SF23SSS45 - Geneva Convention	1	.5	16	7.8	51	24.9	73	35.6	64	31.2
SF24SSS46 - Field communication equipment	27	13.3	62	30.2	62	30.2	41	20	13	6.3
SF25SSS47 - Warning alarms actions	4	2	38	18.5	69	33.7	74	36.1	20	9.8

CLIN =Clinical Competency; OP = Operational Competency; SSS = Soldier Survival Skills; PPP = Personal/ Psychosocial /Physical Readiness; LA = Leadership & Administrative Support; GII = Group Integration & Identification; NC = Not Competent; MC = Minimally Competent; MdC = Moderately Competent; HC = Highly Competent; TC = Totally Competent; TD = Totally Disagree; MD = Minimally Disagree; MdA = Moderately Agree; HA = Highly Agree; TA = Totally Agree. @ Reworded items in scale.



Appendix 10 (cont)  
 Item Frequencies and Percent Response of READI-R-AFN [SF] Scales (n=205)

Item	NC	NC	MC	MC	Md C	Md C	HC	HC	TC	TC
f= Freq / %=Percent	f	%	f	%	f	%	f	%	f	%
SF26PPP53 - Family meet my psychosocial needs	3	1.5	13	6.3	34	16.6	66	32.2	89	43.4
SF27PPP54 - Support system will be in contact with me	0	0	11	5.4	14	6.8	48	23.4	132	64.4
SF28PPP61- Manage stress of job	1	.5	3	1.5	25	12.2	79	38.5	97	47.3
SF29PPP62 - Manage stress with family	0	0	3	1.5	29	14.1	83	40.5	90	43.9
SF30PPP63 - Stress of finances	0	0	1	.5	18	8.8	74	36.1	112	54.6
SF31PPP64 - Emotional support will be accessed	2	1.0	10	4.9	24	11.7	59	28.8	110	53.7
SF32PPP65 - Access to mental health services if needed	5	2.4	5	2.4	33	16.1	54	26.3	108	52.7
SF33LA74@ - Need for rules & regulations on deployment	25	12.2	47	22.9	50	24.4	51	24.9	32	15.6
SF34LA75@ - Commander should look out for wellbeing of people	52	25.4	38	18.5	57	27.8	37	18	21	10.2
SF35LA76@ - Training is realistic	31	15.1	50	24.4	64	31.2	40	19.5	20	9.8
SF36LA77@ - Commander must keep me informed	18	8.8	29	14.1	84	41	49	23.9	25	12.2
SF37GII78@ - Prepared to deal with crowded sleeping	8	3.9	14	6.8	34	16.6	67	32.7	82	40
SF38GII81@ - Understanding Mission, vision, values is important for performance	2	1	14	6.8	45	22	66	32.2	78	38
SF39GII82@ - Will be able to function as a leader if needed	2	1	9	4.4	39	19	80	39	75	36.6
SF40GII83@ - Critical to have a good working relationship with members on deployment	1	.5	2	1	14	6.8	72	35.1	116	56.6

CLIN =Clinical Competency; OP = Operational Competency; SSS = Soldier Survival Skills; PPP = Personal/ Psychosocial /Physical Readiness; LA = Leadership & Administrative Support; GII = Group Integration & Identification; NC = Not Competent; MC = Minimally Competent; MdC = Moderately Competent; HC = Highly Competent; TC = Totally Competent; TD = Totally Disagree; MD = Minimally Disagree; MdA = Moderately Agree; HA = Highly Agree; TA = Totally Agree. @ Reworded items in scale.

## Appendix 11

Item Means, SDs, and Bivariate Correlations with READI-R-AFN [SF] SubScales (n=205)

Item	Mean	SD	CLIN	OP	SSS	PPP	LA	GII
SF1CLIN2	3.47	.95	.75**	.68**	.60**	.42**	.19**	.40**
SF2CLIN8	3.93	.92	.77**	.41**	.44**	.18**	.13+	.21**
SF3CLIN12	3.63	.95	.85**	.50**	.44**	.25**	.10+	.24**
SF4CLIN13	3.37	1.06	.87**	.50**	.45**	.29**	.05+	.27**
SF5CLIN15	2.54	1.20	.80**	.58**	.52**	.31**	.16+	.32**
SF6CLIN16	3.54	1.01	.84**	.48**	.48**	.23**	.12+	.28**
SF7CLIN17	3.15	1.05	.80**	.48**	.51**	.26**	.16+	.27**
SF8CLIN18	3.82	1.06	.73**	.37**	.44**	.25**	.13+	.22**
SF9CLIN20	3.98	.97	.77**	.43**	.55**	.26**	.18*	.26**
SF10CLIN21	3.77	.97	.78**	.56**	.59**	.35**	.19*	.33**
SF11OP31	3.04	1.22	.39**	.75**	.51**	.34**	.31*	.42**
SF12OP32	3.33	1.09	.50**	.79**	.63**	.41**	.28*	.43**
SF13OP33	3.25	1.10	.40**	.77**	.65**	.34**	.25**	.41**
SF14OP34	2.80	1.06	.33**	.72**	.62**	.35**	.30**	.39**
SF15OP35	3.01	1.05	.38**	.69**	.72**	.42**	.27**	.39**
SF16OP36	3.31	1.04	.57**	.78**	.72**	.47**	.26**	.36**
SF17OP37	2.79	1.08	.71**	.69**	.65**	.33**	.27**	.35**
SF18SSS39	3.40	1.05	.51**	.76**	.78**	.33**	.34**	.35**
SF19SSS40	3.06	1.07	.51**	.67**	.76**	.44**	.35**	.38**
SF20SSS41	2.83	.98	.51**	.69**	.81**	.40**	.37**	.37**
SF21SSS43	3.57	1.05	.57**	.71**	.76**	.46**	.34**	.36**
SF22SSS44	3.18	.99	.44**	.71**	.81**	.35**	.26**	.31**
SF23SSS45	3.89	.95	.49**	.71**	.74**	.44**	.29**	.34**
SF24SSS46	2.76	1.11	.42**	.56**	.72**	.31**	.25**	.35**

## Appendix 11 (cont)

## Item Means, SDs, and Bivariate Correlations with READI-R-AFN [SF] SubScales (n=205)

Item	Mean	SD	CLIN	OP	SSS	PPP	LA	GII
SF25SSS47	3.33	.95	.77**	.70**	.77**	.41**	.29**	.37**
SF26PPP53	4.10	.99	.20**	.26**	.30**	.73**	.25**	.29**
SF27PPP54	4.47	.84	.21**	.22**	.22**	.72**	.17*	.36**
SF28PPP61	4.31	.78	.42**	.32**	.43**	.78**	.37**	.49**
SF29PPP62	4.27	.75	.31**	.26**	.33**	.79**	.30**	.37**
SF30PPP63	4.45	.67	.25**	.30**	.40**	.74**	.26*	.38**
SF31PPP64	4.29	.92	.25**	.45**	.38**	.70**	.28**	.44**
SF32PPP65	4.24	.98	.14*	.29**	.27**	.52**	.26**	.31**
SF33LA74@	3.09	1.26	.01+	.28**	.36**	.50**	.68**	.24**
SF34LA75@	2.69	1.31	.13+	.28**	.28**	.21**	.80**	.25**
SF35LA76@	2.84	1.19	.21**	.40**	.37**	.31**	.67**	.37**
SF36LA77@	3.17	1.09	.20**	.28**	.35**	.35**	.71**	.31**
SF37GII78@	3.98	1.09	.31**	.45**	.37**	.46**	.38**	.67**
SF38GII81@	4.00	.98	.23**	.29**	.23**	.29**	.11+	.73**
SF39GII82@	4.06	.91	.44**	.63**	.58**	.49**	.41**	.76**
SF40GII83@	4.46	.71	.06+	.12+	.13+	.25**	.19**	.48**
Item	Mean	SD	CLIN	OP	SSS	PPP	LA	GII
Total Scale	141.19	23.20	.79**	.89**	.89**	.67**	.52**	.62**
CLIN	35.2	8.11	1.00					
OP	21.54	5.7	.62**	1.00				
SSS	26.02	6.29	.62**	.83**	1.00			
PPP	30.12	4.04	.33**	.49**	.49**	1.00		
LA	11.79	3.53	.19*	.37**	.42**	.42**	1.00	
GII	16.50	2.46	.35**	.52**	.45**	.50**	.41**	1.00

CLIN = Clinical Competency; OP = Operational Competency; SSS = Soldier Survival Skills; PPP = Personal/Psychosocial/Physical Preparation; LA = Leadership & Administrative Support; GII = Group Integration & Identification @ Items reworded to improve item in scale.  
 \*\*Significant at  $p < .001$ ; \*Significant at  $p < .05$ . +Items not significant.

AMOS Estimates (MAXIMUM LIKELIHOOD): Standardized Factor Loading, Standard Errors, and Critical Ratios for Readiness Estimate and Deployability Revised for Air Force Nurses Short Form

Variable	CLIN	OP	SSS	PPP	LA	GII	Total
SF1Clin2 - Mass casualty	.71 <sup>1</sup> (.10) <sup>2</sup> 9.95 <sup>3</sup>						
SF2Clin8 - Perform in emergency	.77 (.09) 10.84						
SF3Clin12 - Injuries threaten life	.87 (.10) 12.25						
SF4Clin13 - Multiple trauma care	.87 (.11) 12.27						
SF5Clin15 - Care of patient with ballistic missile injuries	.78 (.12) 10.96						
SF6Clin16 - Tension pneumo-thorax	.82 (.10) 11.58						
SF7Clin17 - Fluid replace of burn	.77 (.11) 10.83						
SF8Clin18 - Administer blood	.68 (.11) 9.59						
SF9Clin20 - Airway management	.73 (.11) 10.22						
SF10Clin21 - Implement triage	.72 (.10) 10.22						
SF11Op31 - Air evacuation skills		.67 (.16) 7.75					
SF12Op32 - Echelons of care		.80 (.15) 8.71					
SF13Op33 - Law of Armed conflict		.77 (.15) 8.48					
SF14Op34 - Field sanitation set up		.65 (.14) 7.52					

AMOS Estimates (MAXIMUM LIKELIHOOD): Standardized Factor Loading, Standard Errors, and Critical Ratios for Readiness Estimate and Deployability Revised for Air Force Nurses Short Form

Variable	CLIN	OP	SSS	PPP	LA	GII	Total
SF15Op35 - Set up Deployable unit		.64 (.14) 7.50					
SF16Op36 - Deal with unexpected		.72 (.14) 8.15					
SF17Op37 - Terrorist weapons		.61 (.14) 8.15					
SF18SSS39 - Protect self & patient			.72 (.11) 9.94				
SF19SSS40 - Perform in M40 gear			.71 (.11) 9.88				
SF20SSS41 - Care of patient with chemical or biologic injuries			.80 (.10) 11.13				
SF21SSS43 - Skill in field setting			.71 (.11) 9.84				
SF22SSS44 - Decontaminate self			.82 (.10) 11.37				
SF23SSS45 - Geneva Convention			.71 (.10) 9.80				
SF24SSS46 - Field communication equipment			.67 (.11) 9.32				
SF25SSS47 - Warning alarms actions			.73 (.11) 9.31				
SF26PPP53 - Family meet my psychosocial needs				.53 (.95) 2.58			
SF27PPP54 - Support system will be in contact with me				.56 (.84) 2.74			
SF28PPP61 - Manage stress of job				.76 (1.03) 2.83			
SF29PPP62 - Manage stress with family				.87 (1.13) 2.85			

AMOS Estimates (MAXIMUM LIKELIHOOD): Standardized Factor Loading, Standard Errors, and Critical Ratios for Readiness Estimate and Deployability Revised for Air Force Nurses Short Form

Variable	CLIN	OP	SSS	PPP	LA	GII	Total
SF30PPP63 - Stress of finances				.78 (.91) 2.83			
SF31PPP64 - Emotional support will be accessed				.61 (.99) 2.76			
SF32PPP65 - Access to mental health services if needed				.21 (.99) 2.77			
SF33LA74@ - Need for rules & regulations on deployment					.52 (.16) 5.69		
SF34LA75@ - Commander should look out for wellbeing of people					.74 (.20) 6.56		
SF35LA76@ - Training is realistic					.53 (.15) 5.79		
SF36LA77@ - Commander must keep me informed					.67 (.15) 5.79		
SF37GII78@ - Prepared to deal with crowded sleeping						.45 (.90) 2.93	
SF38GII81@ - Understanding Mission, vision, values is important for performance						.48 (.84) 2.98	
SF39GII82@ - Will be able to function as a leader if needed						.83 (1.43) 2.79	
SF40GII83@ - Critical to have a good working relationship with members on deployment						.26 (1.43) 2.79	

[illegible]

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